Issue 65

P★S

1958 Series

THE PREVENTIVE MAINTENANCE MONTHLY

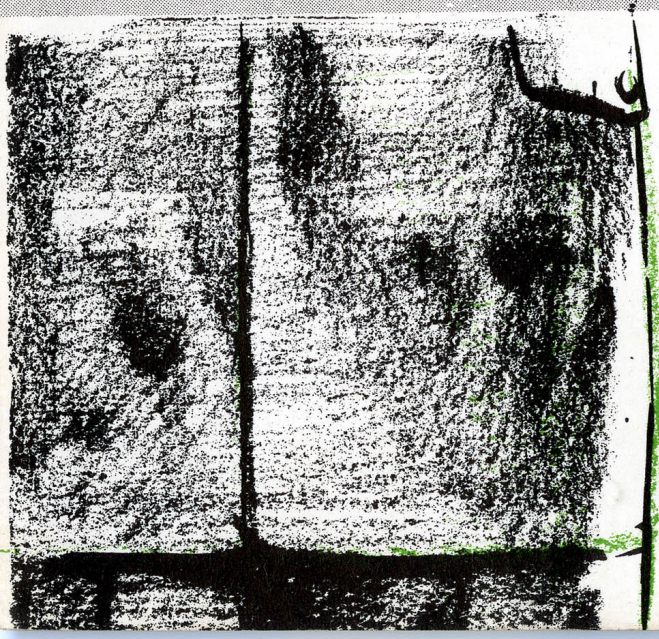
BLACKOUT DRIVING LIGHTS
See Page 29

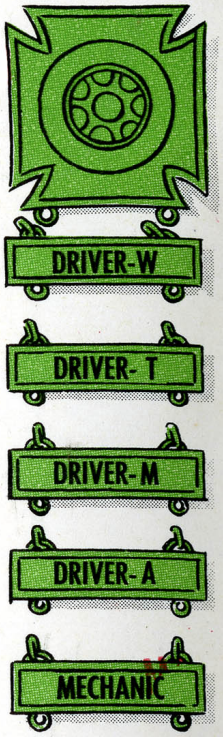
Will Eisner

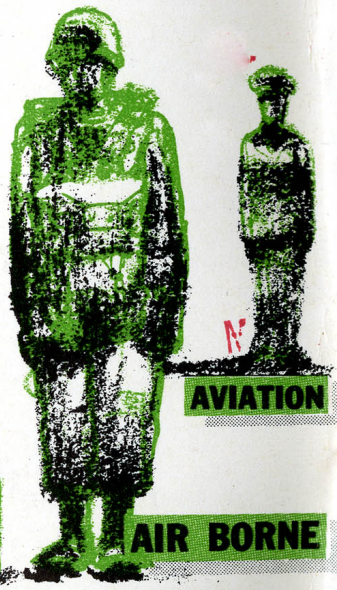
Payday's not the only important day to look forward to. There's another one you mechanics and drivers will want to keep a sharp eye for.

For The Driver
and Mechanic

YOUR AWARD







It's the day your battalion, group, regimental or higher commander steps up to you and pins on your **Motor Vehicle Driver and Mechanic Badge.**

On your badge will be a bar to tell all who see it shine that you're a smooth operator as a wheeled vehicle driver, tracked vehicle driver, motorcycle driver, amphibious vehicle driver or mechanic.

THE BADGE LOOKS LIKE THIS—

AND THE BARS LOOK LIKE THESE—

Pick out the one you yearn for and start to work to earn it. As AR 600-70 says, you can get it for "the attainment of a high degree of skill in the operation and maintenance of motor vehicles." That's easy enough—just keep on doing the good job you've been doing... only better every day.

Now, you drivers have another real deal. It's the **Expert Driver Permit.** It's a way of telling everybody that you have had superduper driving performance and safety records for at least a year. You get the words **Army-Expert** stamped on your driver permit (Standard Form 46). AR 600-55 gives the official scoop.

There you are. Set your sights on your award and get it with top-notch operation and maintenance of your equipment.

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IN THIS ISSUE

EQUIPMENT

Model 128 Circuit Tester-Load Bank	2-13
Tires	14-15, 40-41, 64
Trucks	16, 18, 19, 20, 37, 38, 40, 62, 63
Generators	4-8, 17, 19
Batteries	27, 45-47, 51
Tanks, SP Artillery	2-13, 20, 21, 63
Tractors, Dozers	19, 38-39, 64
Missiles	22-28
Hydrometers	42-47
Army Aircraft	48-50
Field Ranges, Stoves	52-53
Machine Guns	55, 56-58
Flame Throwers	54, 60-61
Carbines, Rifles	58, 59

DEPARTMENTS

Connie Rodd	18
Question and Answer Department	37
Contributions	62
Connie's Briefs	65

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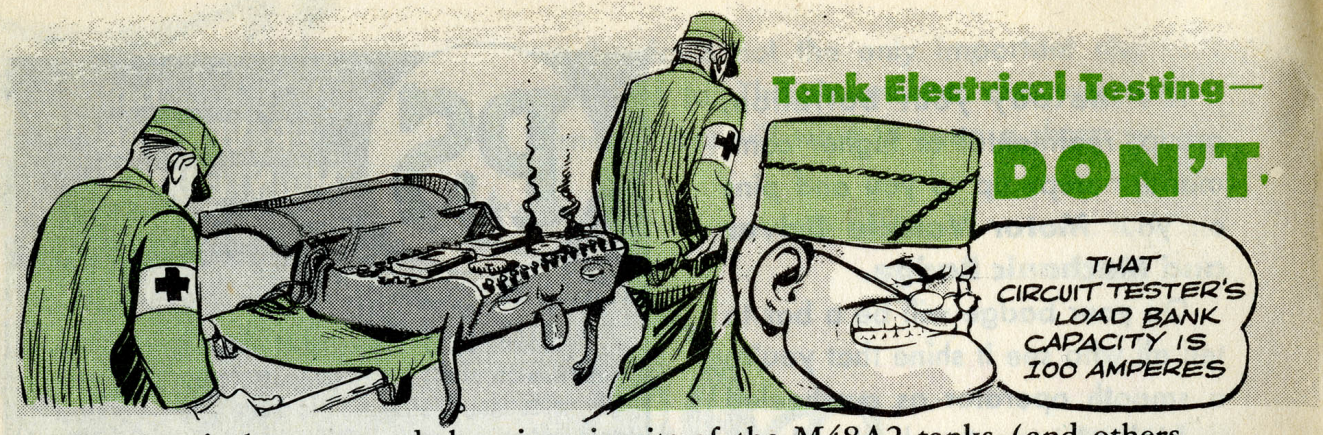
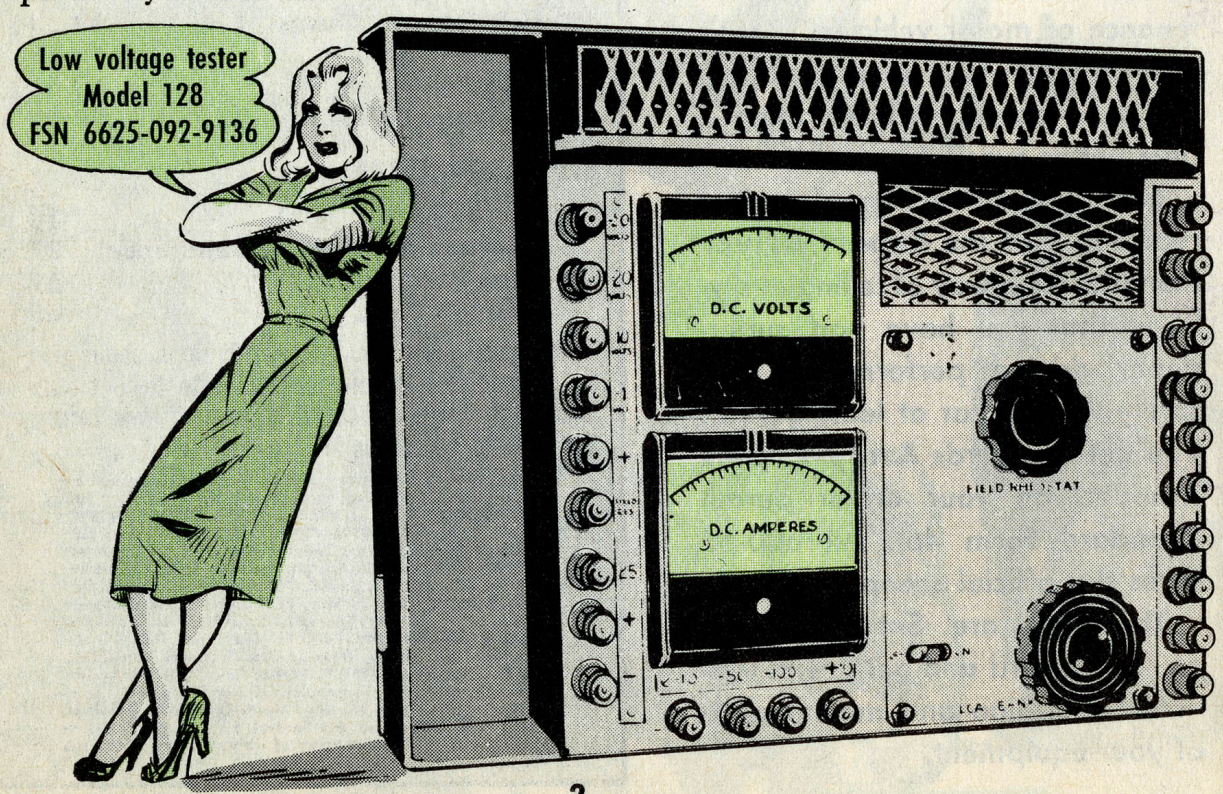


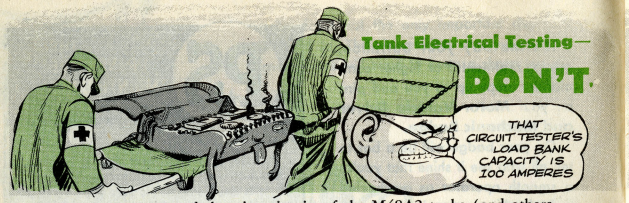
The electrical system and charging circuits of the M48A2 tanks (and others with 300-ampere generators) can be tested with the Model 128 low voltage circuit tester and load bank. But you've gotta be very, very careful or you'll burn out the tester. Because that load bank has a capacity of 100 amperes, thassall. And cranking up a 300-ampere output on your generator with the field rheostat can send it phutttt!

Still, you can send a boy to do a man's job if you can give the boy some help. That's what you do here.

Think a minute about your tank's electrical system. Starting with the auxiliary generator "Li'l Joe," the only thing the unit does to Li'l Joe electrically is check the output. If anything is wrong you pull the whole rig out and send it to your support unit. So, all you've gotta check is the voltage.

On the main engine charging circuit, however, you've gotta check the generator, the regulator assembly, and the voltage-adjusting potentiometer. You replace any one of these that's defective.





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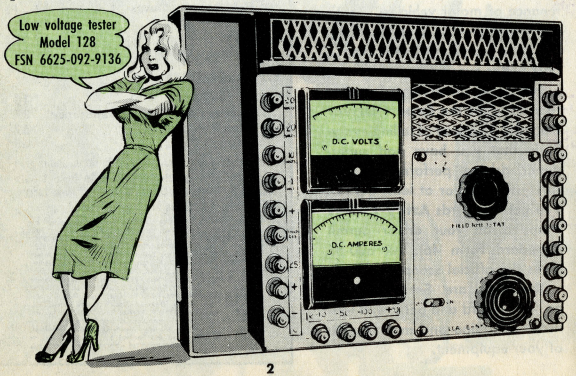
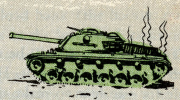


BLOW YOUR BOX



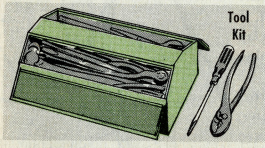
To test your tank, naturally, you need the tank. We'll assume that you have some reason to suspect that the charging systems are not working correctly. Either you've noticed the warning lights indicating "Generator not charging" or your batteries are not staying charged.

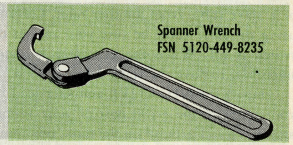
Then you need your low-voltage circuit-tester, with the load bank and field rheostat. This will be your Model 128, FSN 6625-092-9136. It comes equipped with the leads and clips you'll need.

In order to get safely into the circuits you'll need a set of adapters to connect to the Bendix connectors in your tank. Since there are none now issued, you look in your Kit, repair, Bendix waterproof connector set. Your stock room should have the large kit, FSN 5935-570-1380.

About the **minimum** you need by way of adapters is three pins, one to fit the socket in your slave receptacle, (Pin, contact, male, electrical connector, No. 0 AWG, FSN 5935-368-4852), one to fit your generator charging circuit, (Pin, contact, male, electrical connector, No. 4 AWG, FSN 5935-771-6524) and one to fit the generator field circuit, (Pin, contact, male, electrical connector, No. 12 AWG, FSN 5315-752-7655). However, you can go on from there with shells and grommets to make your adapters as fancy as you like. The point is this: **Do not attempt to insert anything except the proper pin into your circuits, you'll likely louse up the sockets.**

If you can't locate a waterproof connector repair kit, see your Ordnance support. Chances are they have either the kit or some salvage connectors lying around.





And, of course, you'll need your regular mechanics' tool kit and the hook spanner wrench, FSN 5120-449-8235, from the second echelon No. 1 Common tool set. (This is to loosen the Bendix connectors in the tank.)

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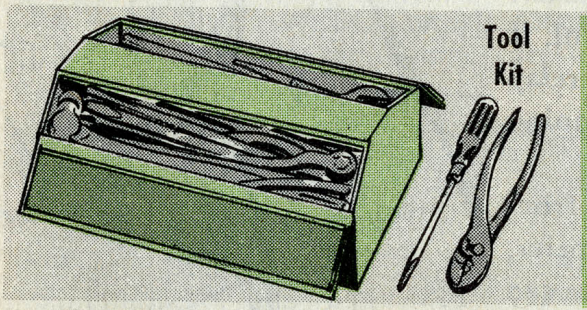

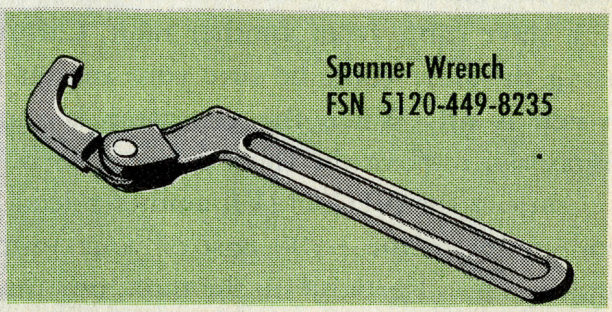

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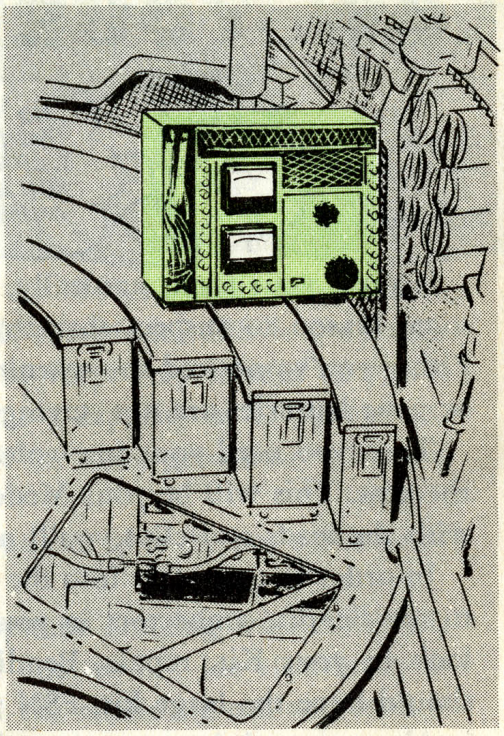
TESTING

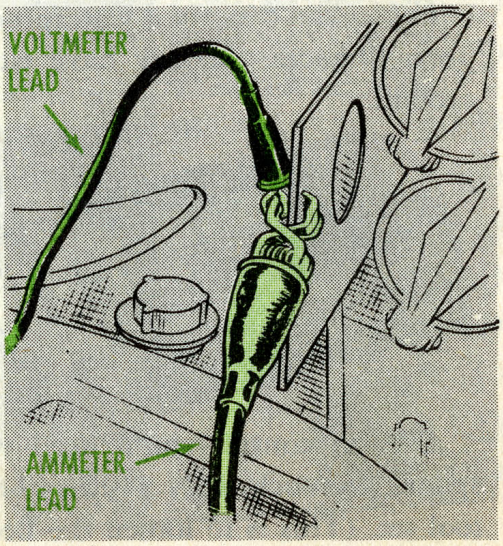


Testing this tank will be much easier if two men work together on it. However, it is possible for one man to make the checks. It's just unhandy.

Since you will be causing temporary surges of fairly high voltage, you must be sure that all the electrical equipment in the tank is turned off. This includes the dome lights. So locate your tank where you can bring in a drop lamp or two for light from an outside source to work by. Take your tester down into the turret basket and open it up. The handiest location for the tester, with cover removed, is on the ammunition boxes under the tank commander's footrest. Fold the footrest and lean the tester back at such an angle that you can see the dials and reach the knobs from the driver's seat.

AUXILIARY GENERATOR TEST

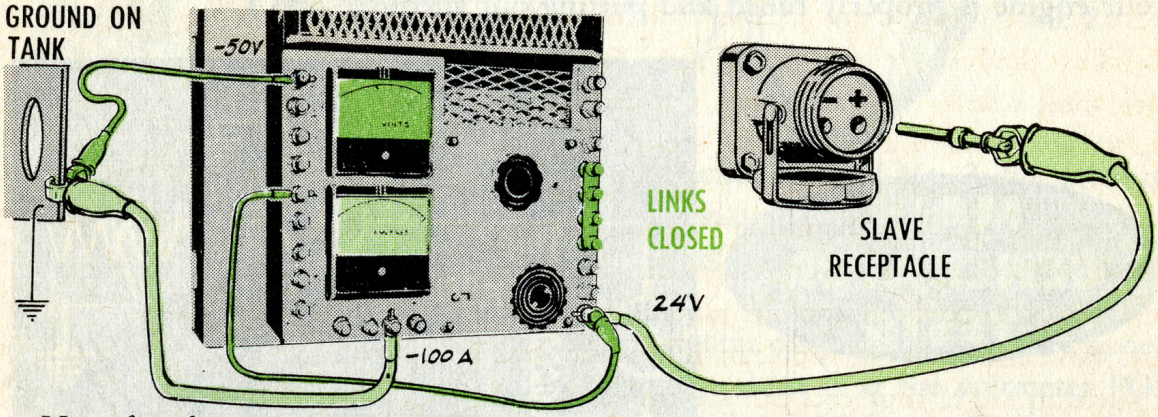
Obviously, to test Li'l Joe, you must be able to run it. If the batteries are charged enough to start the auxiliary generator, you have no problem. If not, you can hand-start it, or slave it from another tank. This presents a problem, since you'll be hooking up your test leads at the hot (positive) side of the slave receptacle. However, if you follow this procedure exactly, no arcing will result when you hook up with Li'l Joe running.



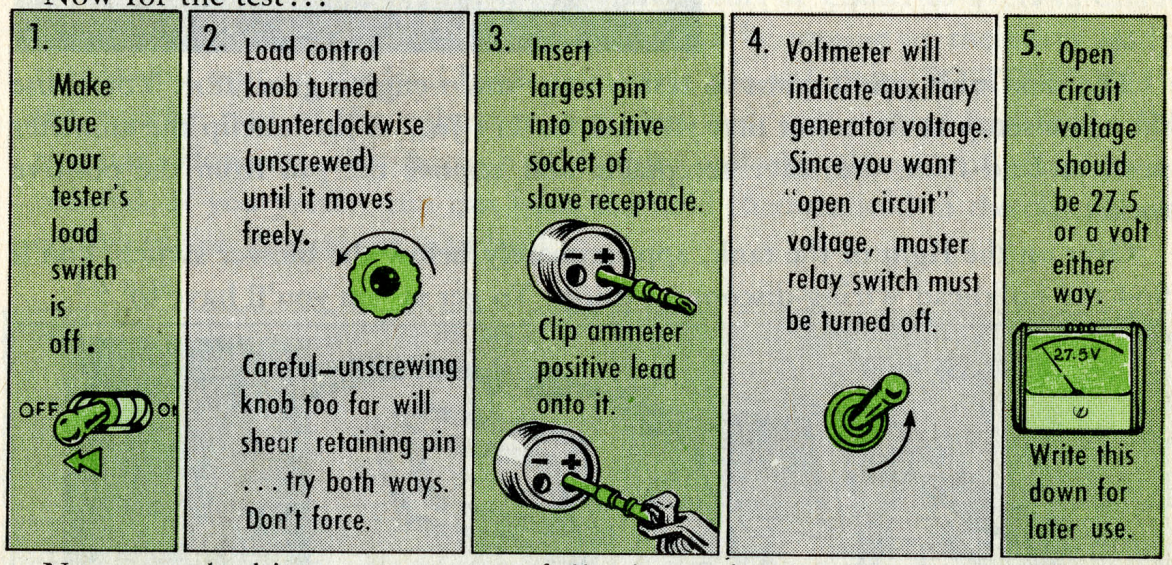
First, start your auxiliary generator, either with the tank's own batteries, the hand starter, or a slave cable from another tank. Careful, if using the slave cable be sure your master relay switch is **off.** When the generator is running smoothly, remove the slave cable, if used.

Connect the NEGATIVE ammeter lead from your tester to the —100 post of your ammeter, and to a **good** ground on the tank, one that can absorb 80 amps. Connect the NEGATIVE voltmeter lead from your tester from the —50v post to a good ground on the tank. Then connect the

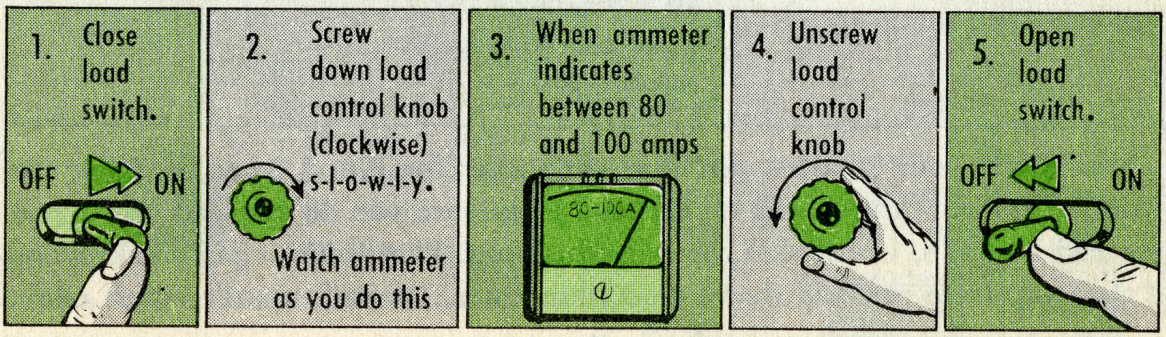
POSITIVE ammeter lead to the 24-volt post of the load bank (the bottom post on the right-hand side) and be sure your three links in the load bank posts are **closed.** Next, bring the POSITIVE voltmeter lead around from the voltmeter + post on the tester, and clip it onto the 24-volt post of the load bank. (The same post you have the ammeter POSITIVE lead attached to.) This sets you up to make a voltage reading on the Li'l Joe output, and also to draw 100 amperes from Li'l Joe without changing your hookup, and with only one clip to connect to the slave receptacle.



Now for the test...



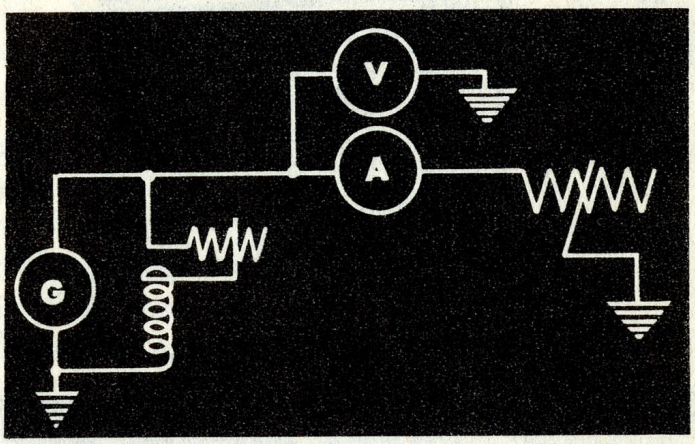
Now, watch this next move carefully, 'cause here's where you can pop the load bank if you get careless.



This is all you can do by way of testing the auxiliary generator with the equipment you have at hand. True, 100 amperes is only a third of the rated output for this generator, but it's all you can safely pull through this load bank. And the fact is, if you get 100 amperes, and the voltage doesn't fall more than .6 volt below the open circuit voltage, the chances are that Li'l Joe is OK.

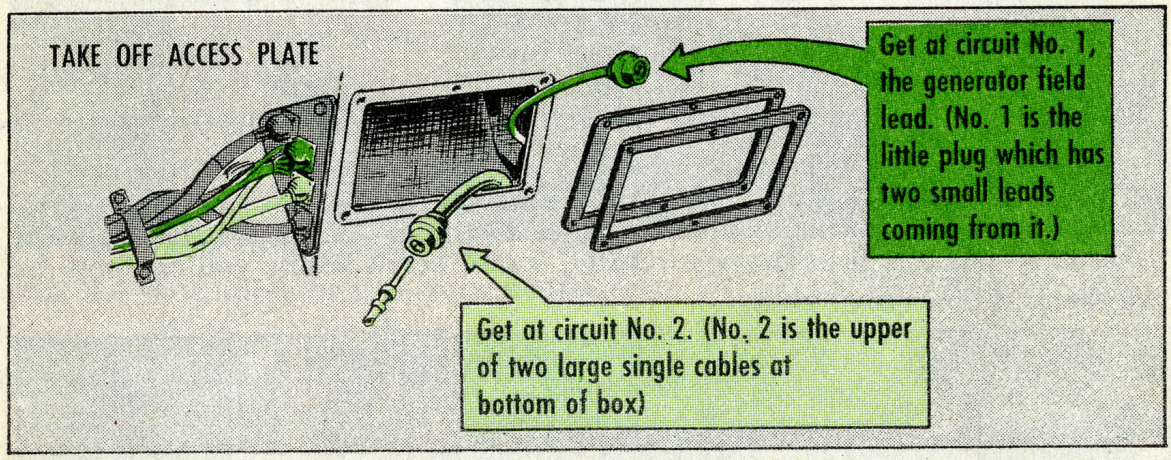
Of course, if you can't get at least 26.5 volts at 60 amperes from the auxiliary generator, or if it falls more than .6 volts under load, you swap the unit for a good one and send it back for a complete check at Ordnance. (First being sure your engine is properly tuned and putting out adequate revs.)

MAIN GENERATOR TESTS

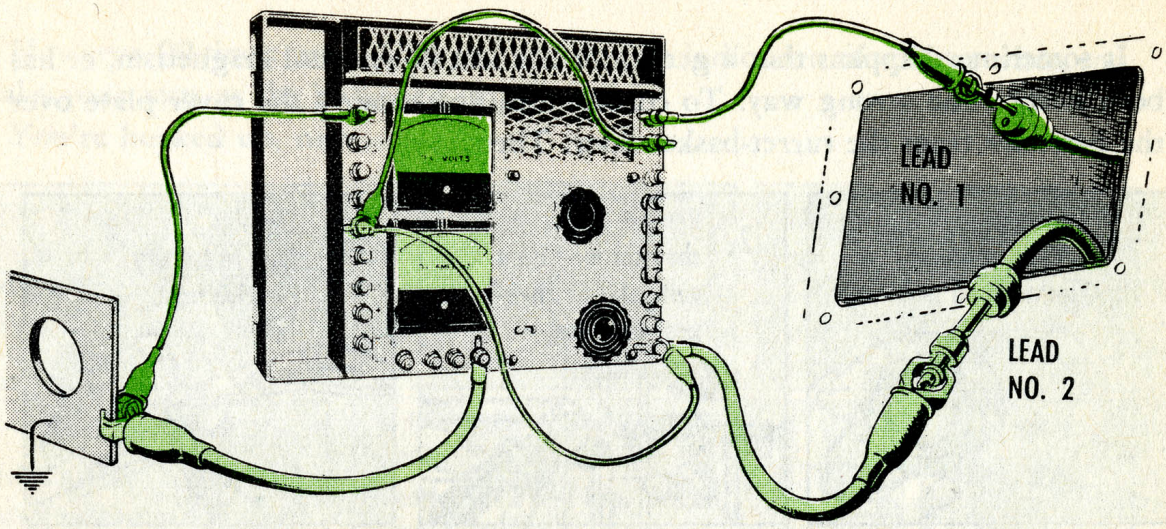


The next unit you'll want to test is your main engine generator. You'll use the same setup at the tester that you did for Li'l Joe, so just unclip the ammeter positive lead from the slave receptacle and remove the pin from the positive socket.

Over on the right of the tank, approximately below the blower switch, you'll find the bulkhead wiring-disconnect plugs. To get at 'em you'll have to . . .



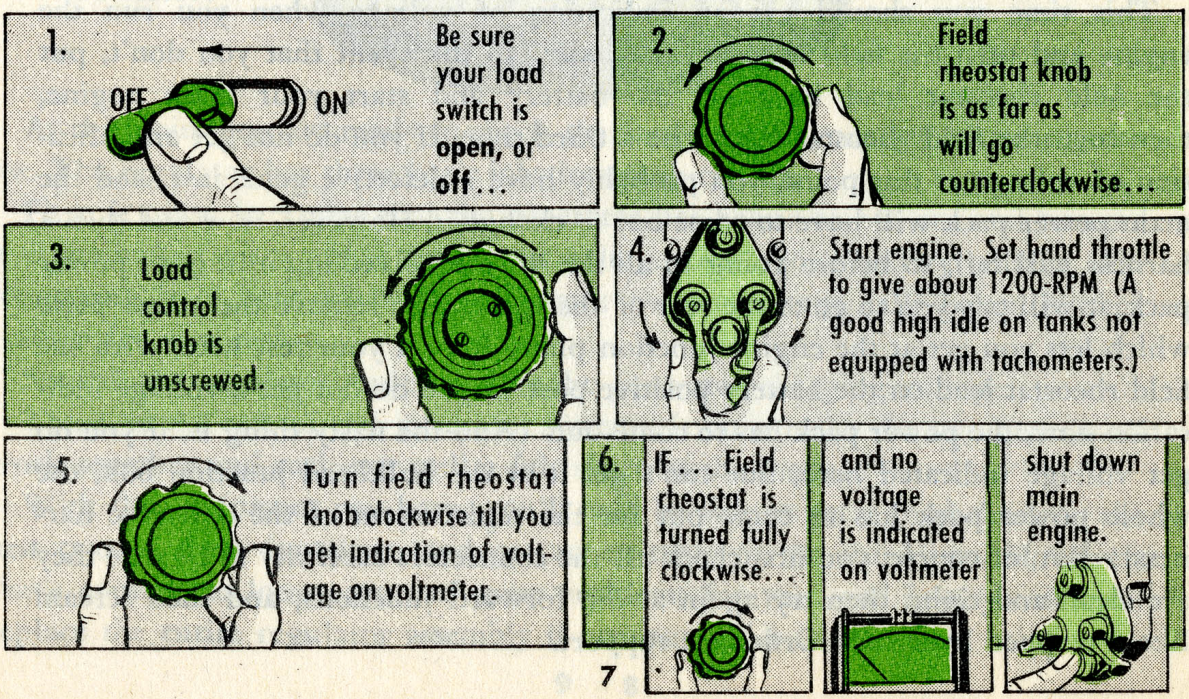
You insert your smallest pin into the socket for No. 1 lead, checking the little metal identification clip on the lead to be sure you do get lead No. 1 and not lead No. 478, which also comes to this plug. To this No. 1 pin you clip one of the leads from the field rheostat on your tester, (doesn't matter which one).



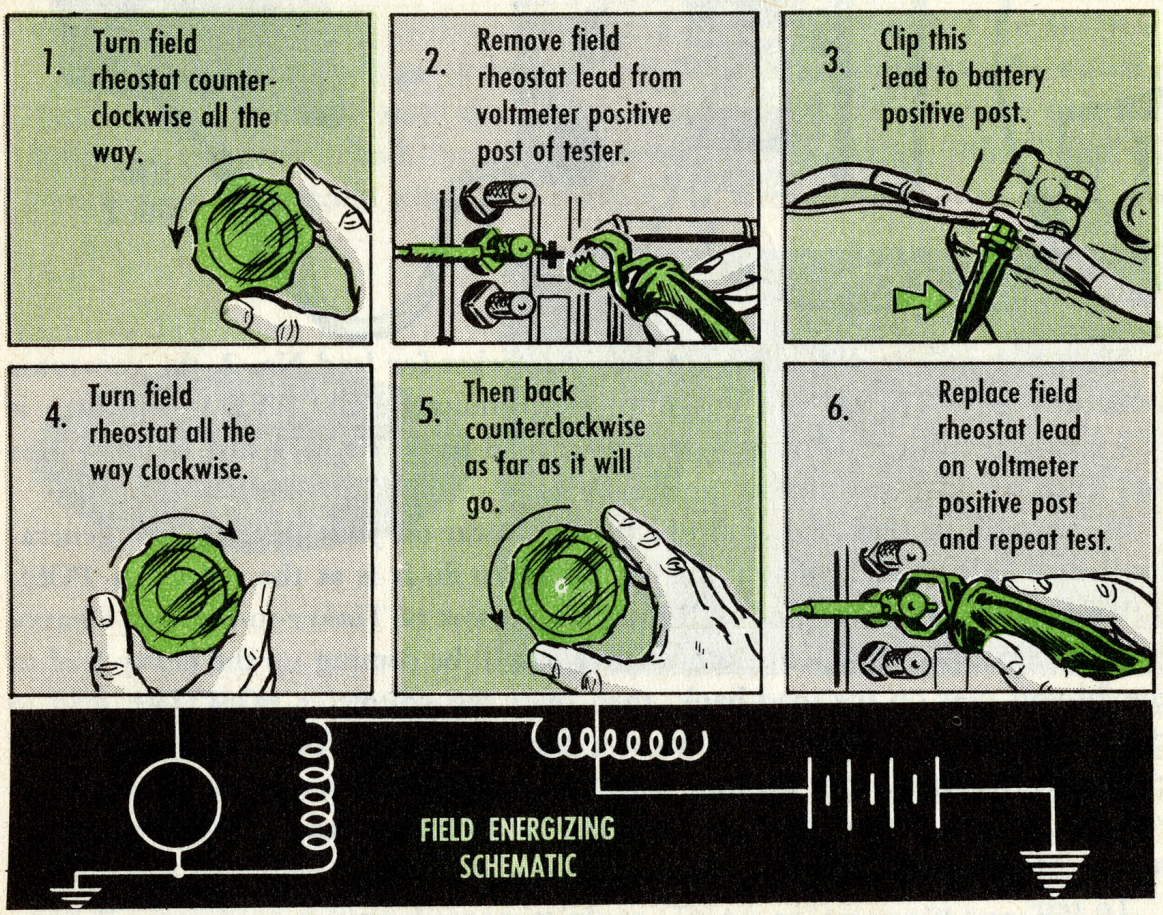
Then put your middle-sized pin into the socket for lead No. 2, the generator armature lead. To this pin you clip your ammeter POSITIVE lead, which is still connected to the 24-volt post of your load bank. Be very sure that the pins and clips are not grounding on the tank.

Connect the second lead from the field rheostat on your tester to the generator armature circuit. Probably the best place to do it is at the voltmeter POSITIVE post of the tester. You will then have a sort of Tinker-to-Evers-to-Chance hookup, since the generator output current will be coming up the heavy lead to the 24-volt post on the load bank, then over the voltmeter POSITIVE lead to the positive post of the voltmeter, and then over still a third lead to the field rheostat. However, this hookup is simple, and the chances of shorting are reduced. If you prefer, you can hook the field rheostat lead to the clip already on the 24-volt post of the load bank.

To test...



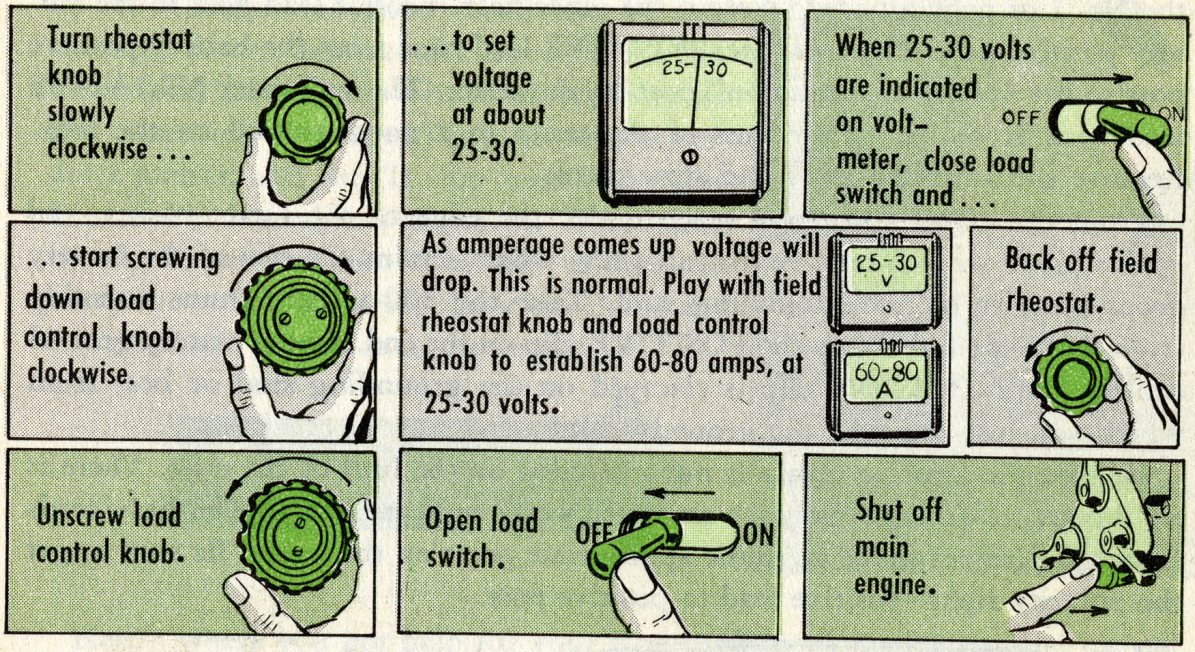
It sometimes happens that a generator has lost its residual magnetism, or has been flashed the wrong way. To correct this, you remove the cover plate over the batteries from the turret-basket floor. Then...



This time you should get an indication of voltage when you run the engine and turn the field rheostat clockwise. In the event that you don't, put the field rheostat lead back on the battery and start your main engine, then turn the field rheostat clockwise a third time. If you do not get an indication of voltage at this point, you probably have a defective generator, and the main power pack will have to come out to change it. However, now and then a harness will fail, so before going to all the work involved in pulling the power pack, it will pay you to go to the rear of the turret and remove the access plate which lets you get at the engine junction plate. Repeat your test here, with the field rheostat lead on the battery positive post. If you do not get a voltage indication now, the power pack has to come out. (And the nasty thing is, if you do get voltage indicated here, but can't get it at the bulkhead junction box, the whole power pack has to come out for the replacement of the defective harness!) But, of course, you first check all the connectors carefully to be sure they are clean and tight, then try again at the forward junctions, and then scream like a trapped hyena for Ordnance support.

However, 99 times out of 100, you will find an indication of voltage when you make your tests at the bulkhead disconnects.

You're hooked up, now...



. Once more, you have only drawn a fraction of the output of the generator. However, you have established the fact that it will charge, and by drawing your 60 amps, you have shown that there are no real glaring faults in it. Later you'll shove this one up to full output for just a brief second, using your vehicle batteries to absorb the load.

REGULATOR TESTS

At this point you are ready to check the functions of your generator regulator. The regulator has three basic jobs in a tank circuit.

First, it must determine that the generator has begun to put out and connect it to the batteries as soon as the output voltage rises above battery voltage, disconnecting it at once when the generator output voltage falls below battery voltage for any reason.

Second, the regulator must regulate the generator charging voltage.

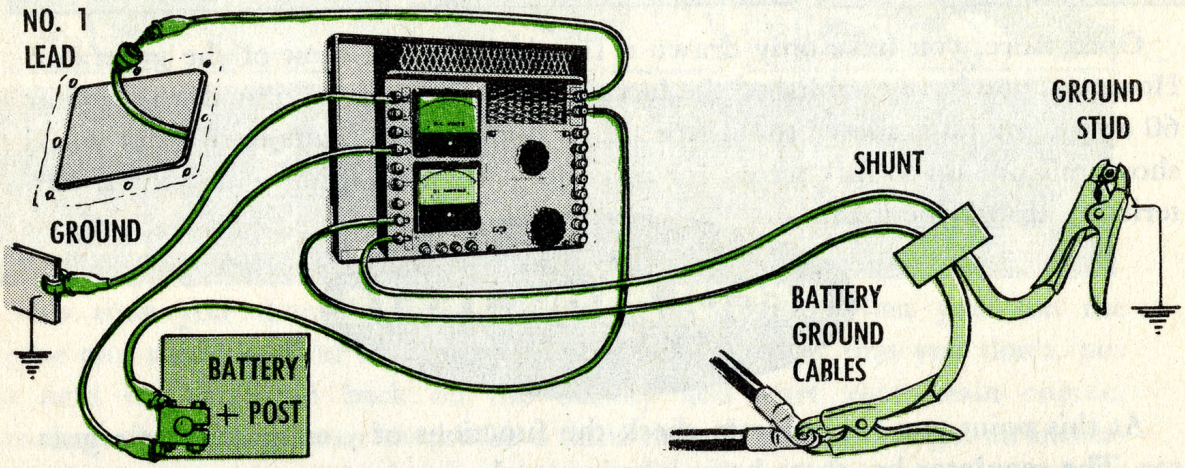
Third, in the case of two-generator systems, it must make the two generators work together and each one pull a fair share of the load.

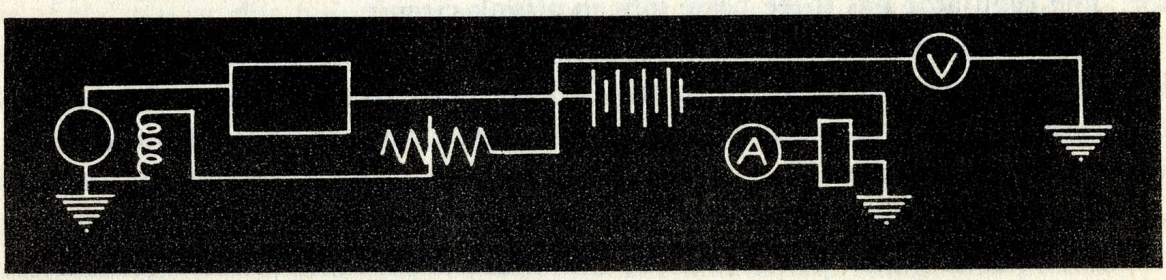
With the equipment you have, you'll only be able to get a good check on the first two of these functions, and get an estimate of the third one. However, that's enough to locate most of your problems for you, and in any case, you replace the entire regulator assembly if any part of it is defective.

To hook up for the regulator tests, take the medium adapter pin out of the No. 2 or generator output lead and fasten the lead back to the bulkhead connector. One lead from your field rheostat is still attached to the pin adapter in the No. 1 or generator field circuit; the other field rheostat lead goes to the battery positive post. The voltmeter POSITIVE lead runs from the battery positive post to the voltmeter "common" post on the tester. The voltmeter NEGATIVE lead runs from the —50v post of the tester to a good ground on the tank. Remove the ammeter leads and stow them.

From the driver's seat you reach under the edge of the turret basket, and with a 9/16-in wrench remove the cap screw which retains the eyes of the battery ground cables on the grounding stud. Take the 500-ampere shunt assembly from the tester and clamp the POSITIVE clip on the end of both battery ground cables. The NEGATIVE clip is clamped on the grounding stud or boss from which you just removed the ground cables.

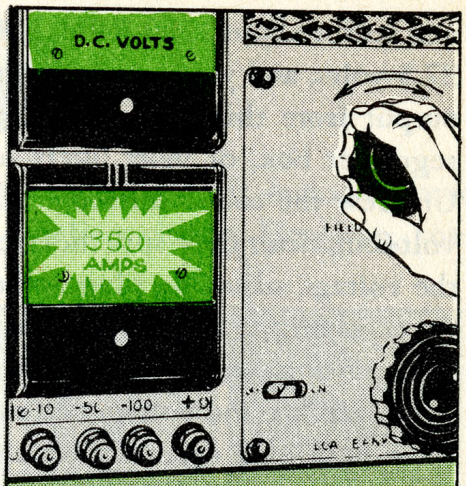
Be sure the positive clamp is not grounded on the hull of the tank. There is no danger of arcing, but your ammeter won't indicate if it is. The light leads from the external shunt go to the appropriate posts on the tester. Be sure to get the polarity right—positive lead to positive post.





Now you're ready to test. With the field rheostat turned fully counterclockwise you start your main engine. Your voltmeter, of course, will show battery voltage. Your ammeter will drop into the negative side of the scale to about 150 amps when your starter is cranking the engine, and return to zero when you release the starter switch.

With your engine turning about 1200-RPM again, advance the field rheostat carefully watching both meter dials. The voltmeter will come up above battery voltage as you advance the field rheostat. Somewhere around 26 volts the ammeter hand should jump over from zero to a positive indication of charge. The exact figures here don't matter, and they'll vary with each regulator and each condition of battery. What counts is this: Somewhere **above** battery voltage, the main line switch in the regulator has closed and connected the generator to the battery.



Advance field rheostat fairly quickly (clockwise). Ammeter needle will swing right up as you turn. Take it up to 350 amperes and immediately take it back (counterclockwise) to near zero.

THIS IS A TRICKY ONE

Here's where you got help for your load bank by using the batteries instead. You will **not** harm your batteries, nor create a hazard if you swing this heavy charge through them **briefly.** You **will** cause overheating, excessive gassing and possibly worse troubles, if you continue this high rate for **longer** than it takes you to read the meter and cut it back.

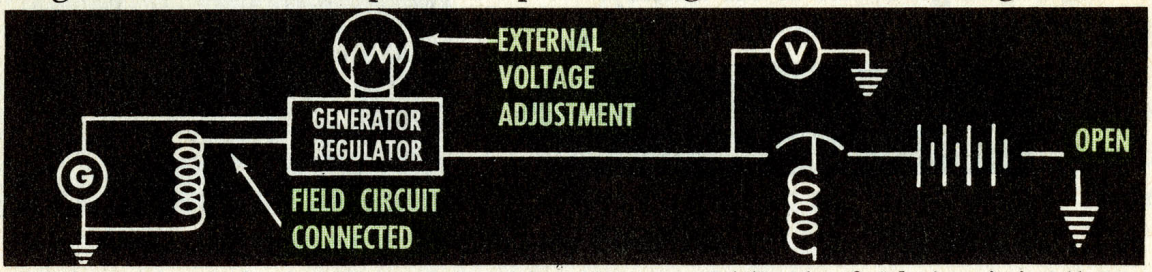
You have now determined that the main line switch and its controlling relay are working on a forward current. You have also determined that the generator will put out at least its rated 300 amperes. Now slowly cut the field rheostat back, counterclockwise, again watching the ammeter. As the generator output dies out, the ammeter will pass through zero and indicate a discharge—current passing in reverse from the battery to the generator. As this reverse current increases, the ammeter should suddenly return to zero. This shows you that the reverse current relay function of the box is working correctly to disconnect the generator when it is discharging. Once more, the exact figure is not too important, the point is that the generator must be disconnected when it is discharging.

WATCH OUT—if for any reason you can get your field rheostat knob so far back counterclockwise that the ammeter shows 100 amps discharge, open your master relay at once and stop your engine. This means you have a defective regulator, and this particular defect will burn things up.

Stop your engine after this test.

Now you have checked generator maximum output and both sides of the control or reverse current circuits. Disconnect the field rheostat leads first from the battery and then from the adapter pin in No. 1 circuit. Remove the pin from the socket and reconnect the field circuit at the bulkhead connector. Start your engine

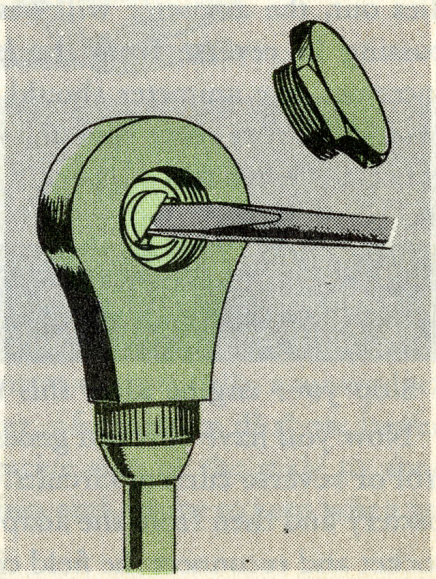
and set for about 1200-RPM. Your voltmeter should show you somewhere around 27.5 volts, and your ammeter should indicate some charge. If you do not get any output from this test, the probable trouble is in the field circuit, either in your regulator box, or most likely in the external voltage adjusting potentiometer. Unscrew the connector from this pot, (leads No. 950) and use a test light or a volt-ohmmeter to be sure the circuit is complete inside the housing. If not, remove the voltage adjusting plug and cycle the adjusting screw both ways a couple of times, trying to stop approximately where you found it. Test again. (This will sometimes clean the slider and wires and restore the current path.) If still not good, replace the voltage adjustment unit and test again. If, on the other hand, there is a good current path through the external voltage adjustment unit, but the generator still doesn't put out, replace the regulator box and test again.



When you do have the generator putting out while the field circuit is all connected, idle your engine and take the ammeter shunt clip loose from the grounding stud. With your foot throttle, run your engine up slowly to at least 2500-RPM and let it back to idle. Your voltage indication should remain steady at close to 27.5-28 volts.

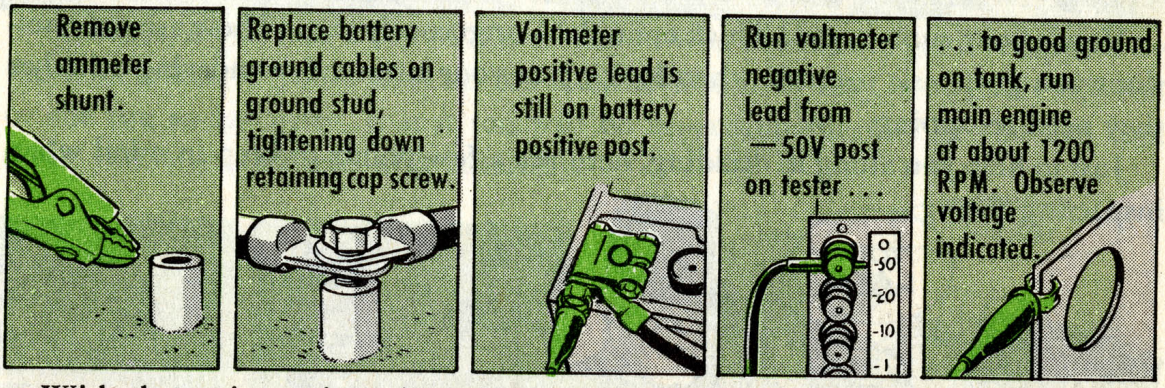
VOLTAGE ADJUSTMENT

Back when you tested the auxiliary generator you were told that 27.5 was the preferred voltage, but that a volt either way was all right. Now, in order to make the job of your paralleling circuit as easy as possible, you must set the open circuit voltage of your main generator as close to that of your auxiliary generator as you can. So now you refer to the note you made of the auxiliary voltage, and, with the main engine running at about 1200-RPM and the ammeter shunt removed from ground, you adjust the main generator to this same voltage, using a screwdriver down the hole of the external voltage adjustment unit. When set, replace the plug.



PARALLELING CIRCUIT

Once more, you would need more elaborate testing equipment, including two ammeters, to get a complete check on your paralleling circuit. However, you can make a satisfactory partial check. Like so...

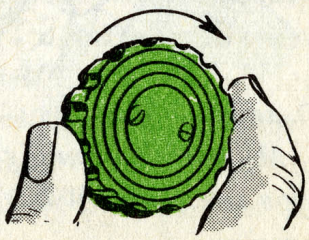


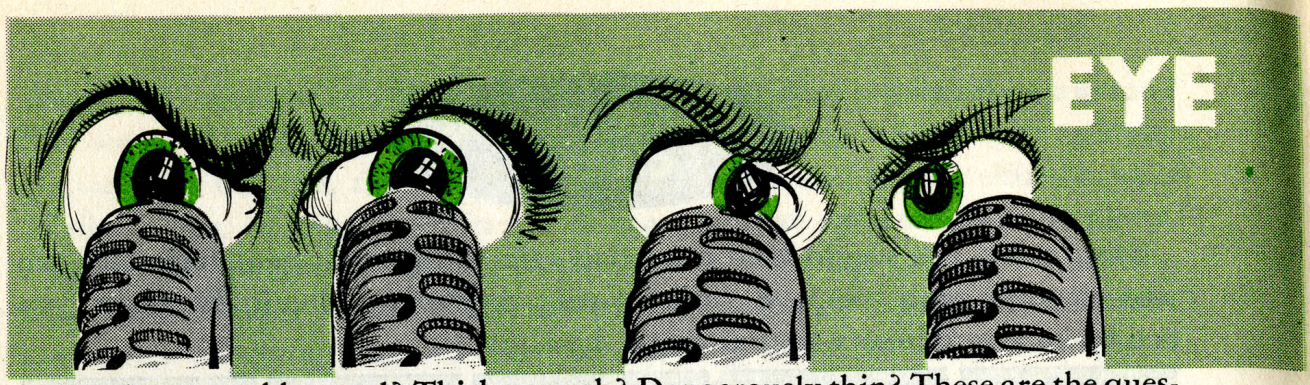
With the main engine still running, start Li'l Joe. Observe the voltage again after Li'l Joe has warmed up a little and settled down to smooth running. Let Li'l Joe run and shut off your main engine. Read the voltage again. If this voltage stays within a volt or two of the same figure with main engine only, both engines, and Li'l Joe only, your paralleling circuits are OK. On the other hand, if your voltage fluctuates more than a couple of volts, or if the auxiliary engine keeps surging or hunting for more than a couple of minutes, you'd better get your Ordnance support to come check it with you.

Well, that's it. These checks are about the best you can do with the equipment now in your hands. They should find defective units for you, so you'll know what to replace to keep your charging systems working. REMEMBER: Take it easy on those generator load tests. Don't draw more than 80 amperes through your load bank, and shut down the minute you read the meters.

DON'T, fer'evins sake, attempt to test a tank generator according to the hookup on page 3 of the manufacturer's instruction booklet that comes with your tester! You'll burn it out sure!

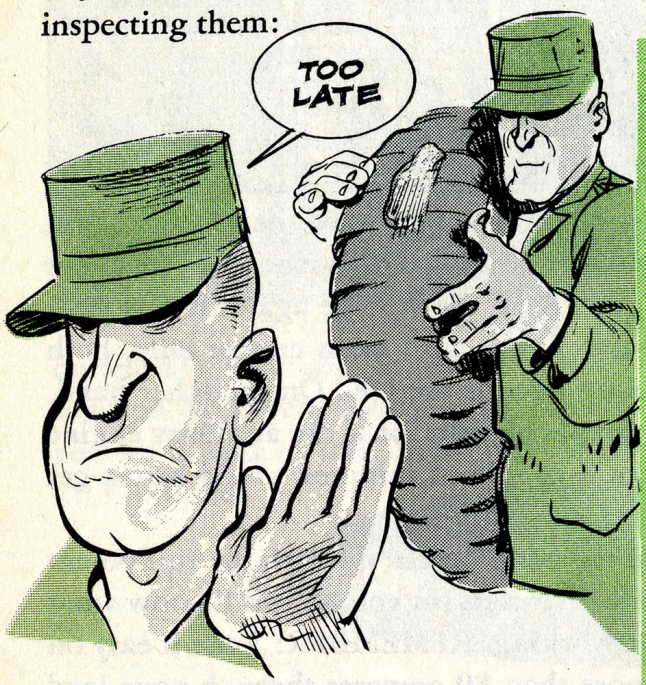
By the way, when you secure your load bank after testing, screw the load control knob in (clockwise) until there is enough pressure on the carbon pile to keep the plates from bouncing around and possibly breaking while the load bank's being hauled around.

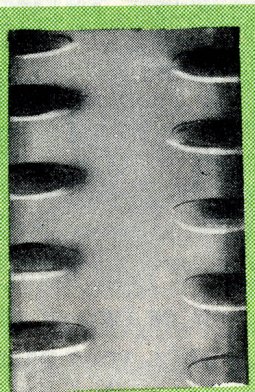




How's your rubber, pal? Thick enough? Dangerously thin? These are the questions you gotta ask yourself when looking at your tires and wondering whether they need recapping.

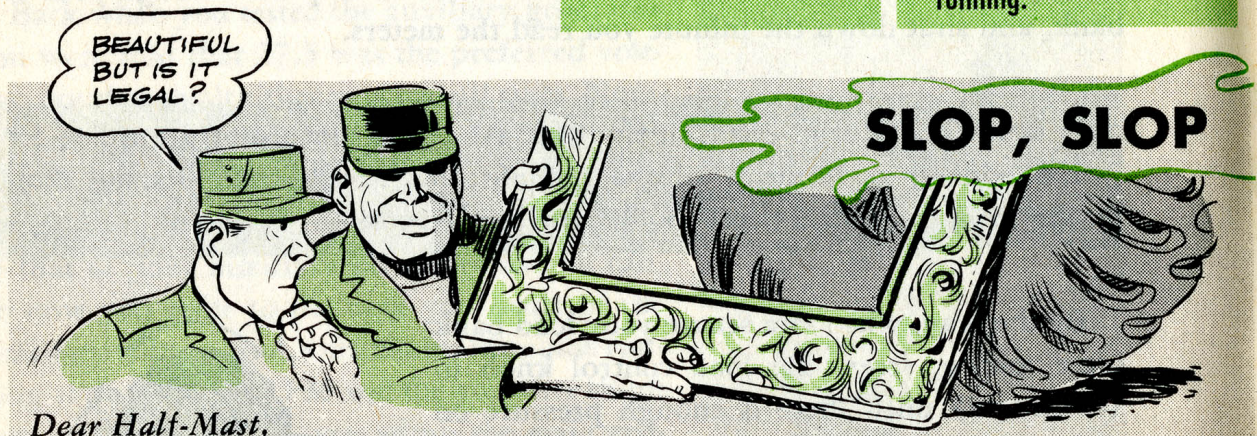
Just to help you along in deciding, here are a few points to keep in mind when inspecting them:





When the tread design is worn off evenly in the center, and has a wide smooth surface, take it off because it's ready to be recapped.

A narrow or medium smooth surface is not worn enough to get it recapped. There's still plenty of tread design in the center—enough to give more miles of running.



Dear Half-Mast,

My outfit's been gigged for painting the tires of our vehicles with commercial-type tire paint. What's the authority that says it can't be done? And, what'll it hurt?

Lt D. R. H.

EYE CATCHING

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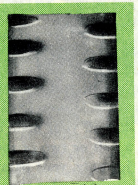

When the tread design is worn off evenly in the center, and has a wide smooth surface, take it off because it's ready to be recapped.

A narrow or medium smooth surface is not worn enough to get it recapped. There's still plenty of tread design in the center—enough to give more miles of running.

O'course, if you take a tire off too soon, you won't be able to get it recapped. By the same token, if you take it off too late, the cord body may be so badly injured, or the tire so far worn, that it too will be un-recappable. So, get an eye cup, wash your eyes out and look carefully.

If your tires show irregular wear—so that the cord body shows in any one spot or is worn through the tread design in several spots—get it recapped.

A tire that looks like this, although it shows shallow irregular wear and very little smooth worn surface, is not ready for recapping. Still got plenty of wear.

But pretty soon there'll be no more guessing whether a tire on your truck's ready for recapping. A tire depth gage, FSN 5210-357-5951, is available for your Tool Set, Organizational Maintenance, Second Echelon, Set No. 1 Common, FSN 5180-754-0654. Keep your eyes open for it. If it doesn't come along soon, put in a requisition for it.

SLOP, SLOP ...SLURP

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Lt D. R. H.

Dear Lt D. R. H.,

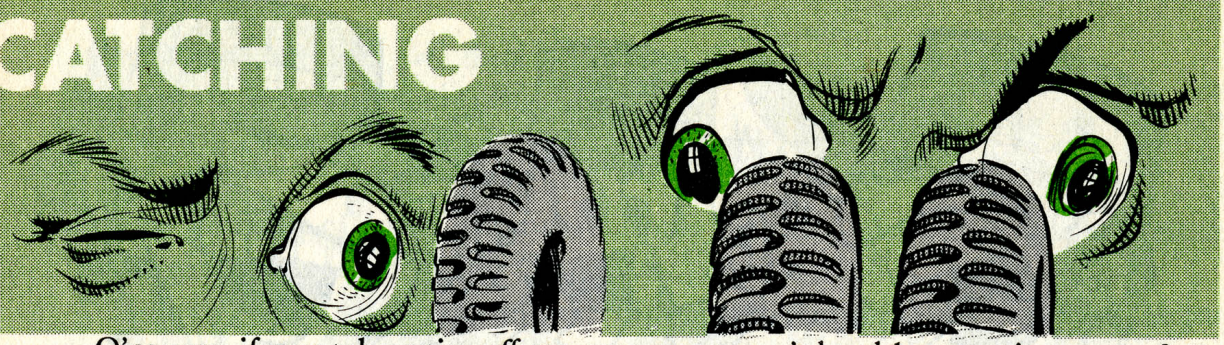
There's no directive, Sir, that says you can or can't paint the tires of Army vehicles with tire paint—and it won't hurt 'em. But, coming right down to it, why waste the money and take the time to do this job when you don't have to?

Actually, the only thing that's required is to keep the tires clean. This can be done when washing the vehicles.

Of course, if your CO laid down the order that tires will be painted—you'll just have to paint.

Half-Mast

CATCHING



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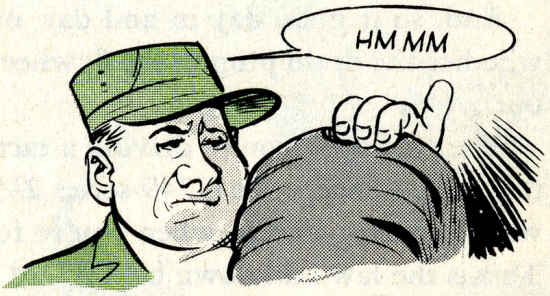

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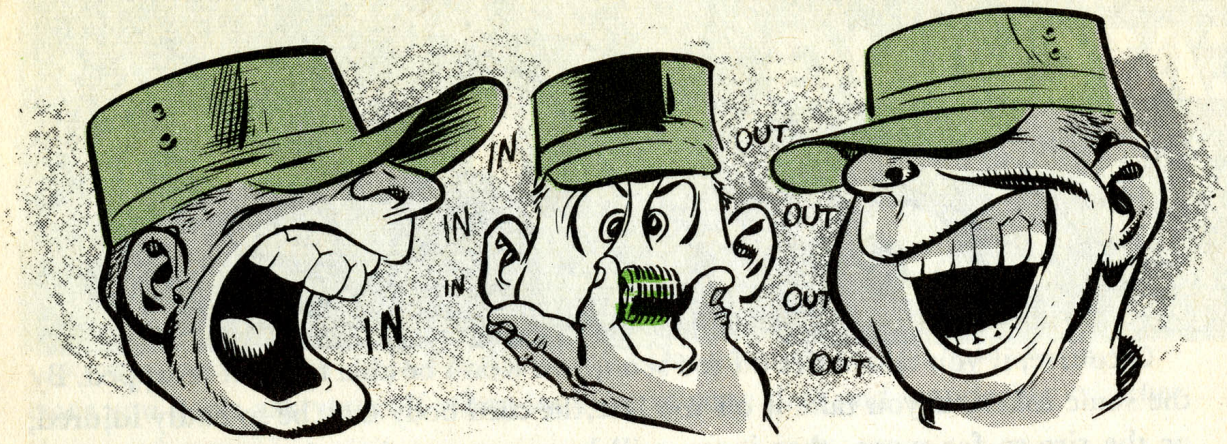


PLUG OUT...NO, IN... NO, OUT... NO, ETC.

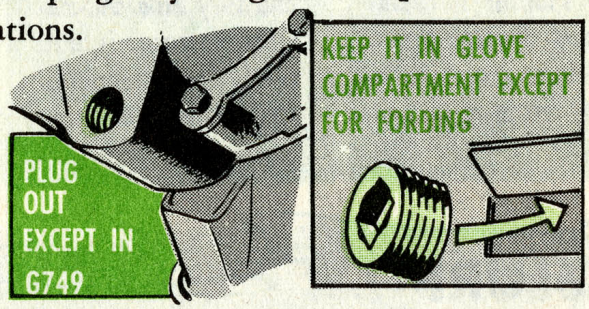
And, so it goes, day in and day out—everybody guessing, and nobody sure whether the drain plug in the flywheel housing of their vehicle stays in or comes out.

The rule is: if you're driving a tactical wheeled vehicle that has a clutch, and they all do except the G749-series 2½-ton truck, that plug stays **out** of the flywheel housing except when you're fording or operating in real muddy country. This is the law laid down by TB Ord 554 (7 Sept 56).

The reason is to get rid of lube that becomes trapped in the flywheel housing—lube which can do harm to your clutch plates. If the plug was left in, so the lube can't flow out, you'd be in for a case of clutch slippage and failure.

The drain plug comes out of the flywheel housings of these series vehicles: G740 and G758 Jeeps, G741 ¾-ton trucks, G742 2½-ton trucks, G744 5-ton trucks and G792 10-ton trucks. Keep the plug in your glove compartment, so you'll have it for fording and mud operations.

Now, as far as the drain plug on the G749 2½-ton Hydra-Matic truck—that's different. Because they don't have clutches. The drain plugs for these trucks stay **in** the flywheel housing all the time.



This plug gives you the chance to check the internal condition of the Hydra-Matic's flywheel housing. At every 1,000 miles (C-service)—and every time after fording—you take this plug out, so water and oil can drain out. Too much oil means you have a leak somewhere up that housing, and you'd better check it out to see what it's all about. As a matter of fact, MWO Ord G749-W23 (24 Mar 56) tells your Ordnance outfit to tap this plug into your flywheel housing if your truck hasn't got one.

So, no more guessing. Your G749 2½-ton Hydra-Matic trucks—**plugs in** all the time. Your other M-series tactical wheeled vehicles—**plugs out** all the time, except when fording and operating in mud.

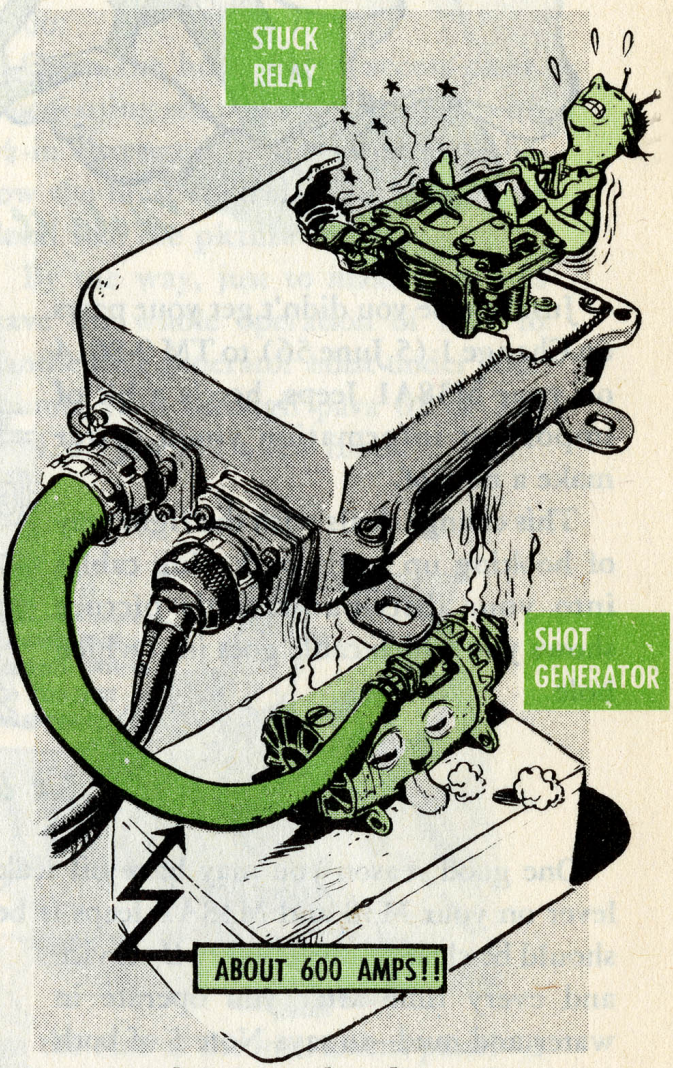
If your regulator conks out, check the generator too. You may be heading for—

LOOSE COMMUTATOR BARS

The problem of loose commutator bars on the Delco-Remy 24-volt waterproof generators is still rising up to haunt people.

Nobody knows all the answers on this one yet, and the designers are still hunting for a final solution. But, this they do know: It is possible for **some** regulator failures to louse up the generator, and later on, a commutator bar may rise up on you and chew up the brushes.

It works like this: Any time you have a stuck reverse current relay in your regulator, either because someone connected the batteries backwards (reverse polarity) or because a blow or jolt made the contacts close and stick, you get a high current back through the generator. This current can range around 600 amperes at times, and makes for much heat and smoke.



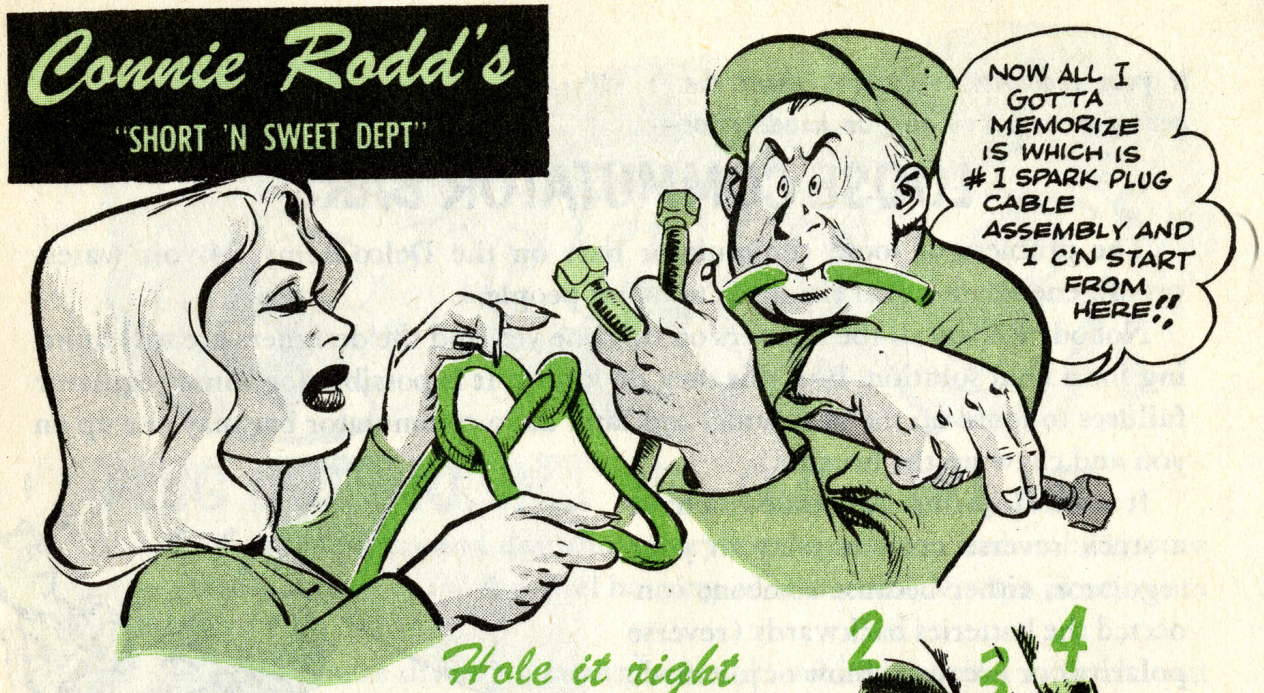
Generally the regulator burns out first, and so you replace it. The generator then works OK, apparently, and the truck goes back to work. But, if the heat of that heavy current across the brushes and commutator has heated the commutator above the baking temperature at which it was made, it is possible for the binder material in the mica to soften. Subsequent running of the generator causes centrifugal force to lift a commutator bar, which causes arcing, brush cutting, and still more heat. Gives a shot generator.

Sooooo, if you do have a regulator failure **involving stuck relay points or reverse current,** when you replace the regulator, please to send the generator back to Ordnance with it. There they'll open it up and check the commutator.

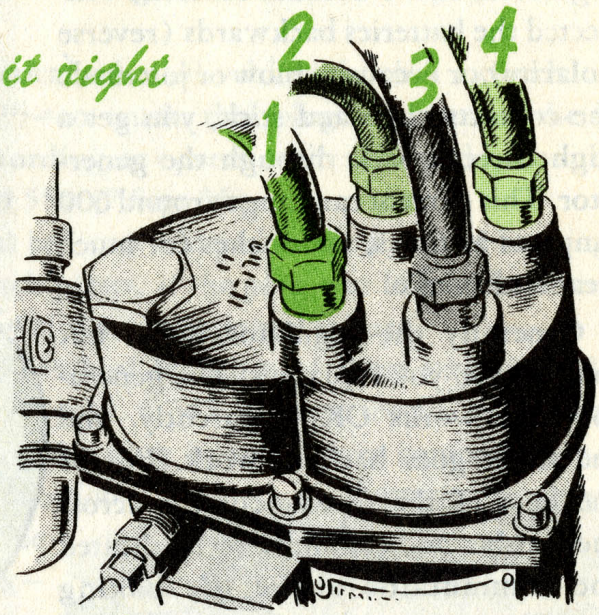
Swapping generators only takes a minute, and may save you from a long walk home. Also, of course, it is far cheaper to have Ordnance check that armature and replace it if needed than to wait until a bar or two come loose and chew up your brush ring.

Connie Rodd's

"SHORT 'N SWEET DEPT"



Hole it right

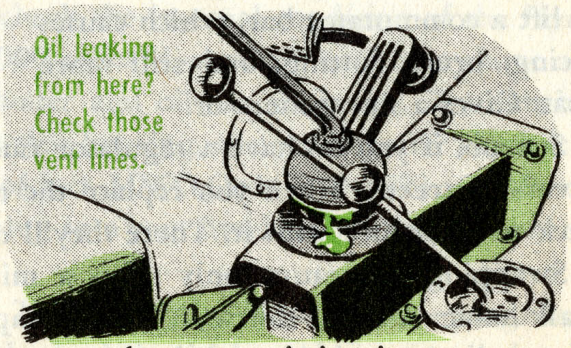


Just in case you didn't get your paws on Change 1 (5 June 56) to TM 9-8014 on your M38A1 Jeeps, here's a bit of important information you'd better make a note of.

This change deals with the right way of hooking up your spark plug cables into your distributor. This picture shows you which cable goes into which hole.

Clean vents

One good reason you may have oil leaking up around the transmission shift lever on your M38 and M38A1 Jeeps is because of clogged up vent lines. These should be cleaned out at every B-service and every time after you operate in water and mud—so says Note 5 of both LO 9-8012 and LO 9-8014.

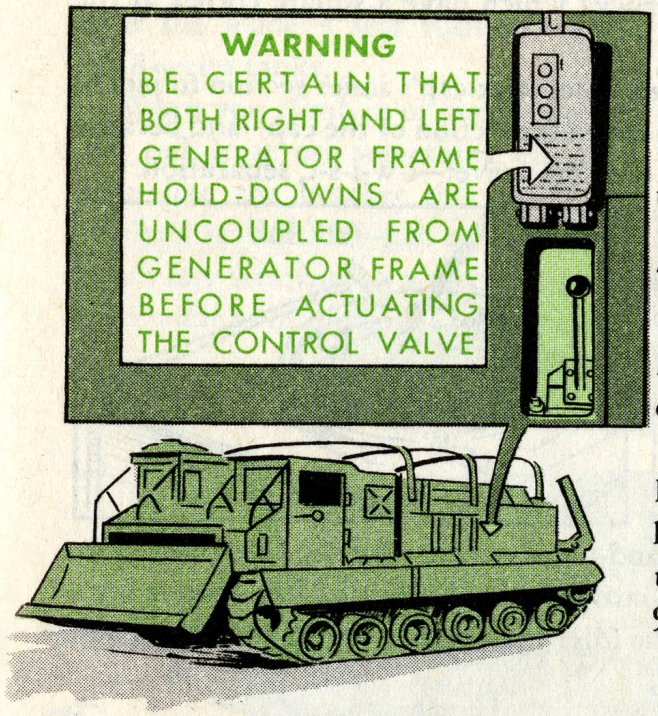


Doing it like this will keep those vent lines unclogged, and will keep any pressure from building up and blowing the oil out around the shift lever.

Of course, to keep oil away, also make sure that transmission is never overfilled. Make sure the lube's up to plug level when cold.

Warning notice

When it comes to operating your M8A1 cargo tractor's generatof hoist, the most important thing you've gotta remember is to uncouple both the right and left generator frame hold-downs from the generator frame before you start to lift. Trouble can break loose unless you do.

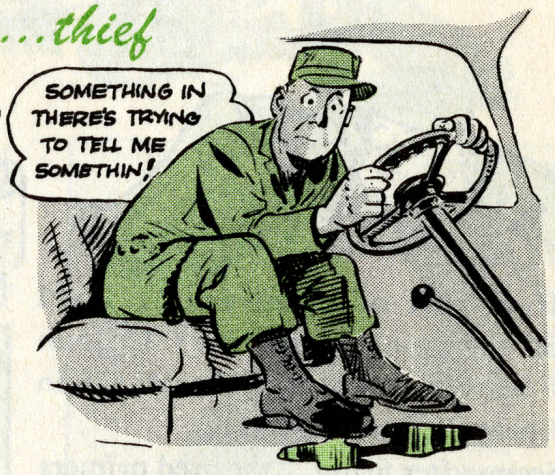


So, just to make sure this is in full view so you won't forget, here's what to do:

Open the hoist valve access door. Then, using red paint and a stencil with ⅜-in characters, put a notice right below the hoist control valve instruction decal like the picture shows.

By the way, just to make sure you have the whole operation of how to handle that generator hoist under your thumb, read through para 62 of TM 9-7420 (Jan 55) a few times.

Stop...thief



Bug-a-boos in the oil line leading to the oil pressure gage of your 1956 ½-ton Chevy pickups (Model 3100 series) can start causing flubs pretty soon now, unless you crawl underneath that vehicle's cowl and make sure everything's jake.

You could find that the oil line going to the oil pressure gage, as it passes under the cowl—about four inches back from the rear of the instrument panel—is getting swiped by the left windshield-wiper actuating arm when you use the wipers. On a rainy day that line can start looking as holey as an oil filter cartridge.

And, you won't go far, either, if this happens—'cause oil'll start to leak from that line. The first tip of this happening would be an oil drip right on your size 12's as you're driving.

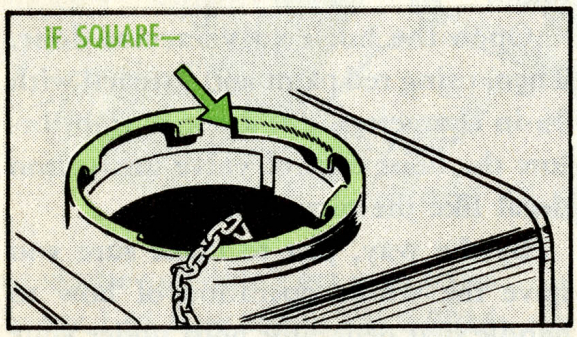
To fix 'er up—if it's happening—bend the oil line down about ¼ inch away from the actuating arm. In other words, give her lots of clearance.

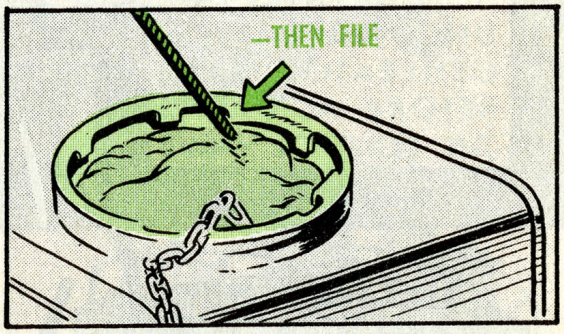
Round that square

There've been cases of the inner and outer sections of the G-744-series 5-ton truck's fuel-tank filler-cap becoming separated when the cap's been twisted while seated in the filler-neck.

It's been happening on some of the trucks which have a square corner at the end of the filler-neck cam-surface.

It's this corner that causes the lug on the fuel tank cap's inner section to jam in the filler-neck cam-slot. When you twist the outer section of the cap—and because the inner and outer sections are held by one small rivet—t-w-i-s-t, separation.





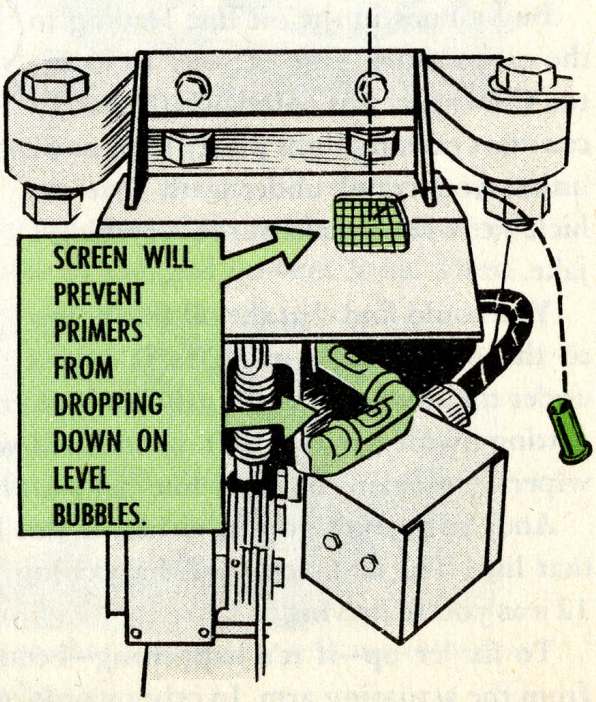
Now, if you come across this, just hand-file the corners of the filler-neck cam-surface just enough to get rid of the square point. Before filing, tho, better lay a clean cloth coated with clean grease in the filler-neck—just so's no steel filings will fall down into that fuel tank.

Save the bubble

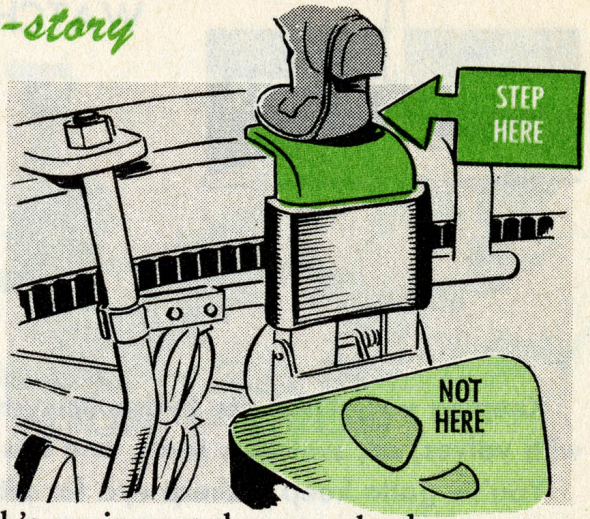
Hear tell of equilibrator level bubbles busting on the M53 155-mm self-propelled guns and the M55 8-in self-propelled howitzers.

Seems after firing... the used primers drop through the hole in the step that's above the bubbles.

You can call a halt to busted bubbles by getting your support unit to tack-weld a piece of wire screen across the hole. The "hardware cloth" is listed under FSN 5335-281-4093.



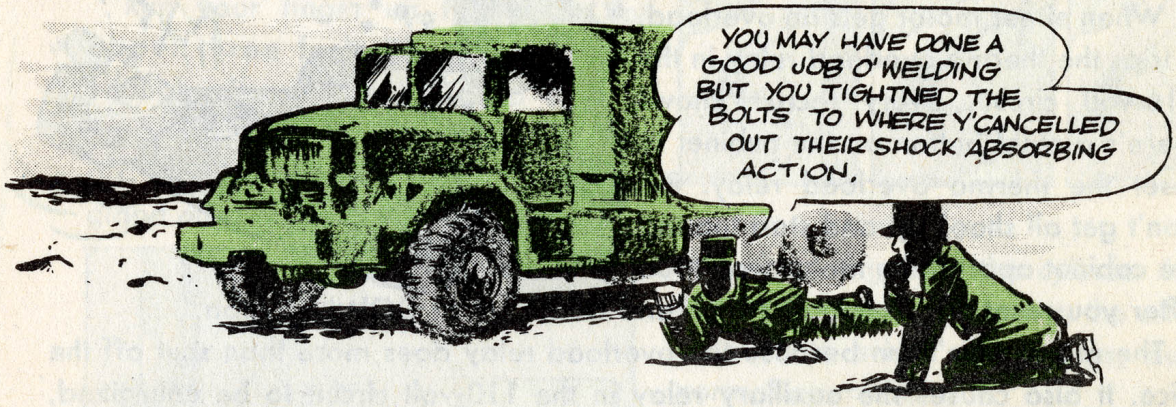
Step-story



Hey you! Yes, you with the giant-size clodhoppers. You may have mink-lined combat boots, but that still doesn't mean you can tromp with your tootsies all over the loader's seat cushion on the M48-series tanks.

When you climb in or out of the turret, puh-leeze use something else as a step—like the bracket that holds the loader's seat on. It's just as handy and much less wearing on a piece of the tank's equipment that your loader may consider vital to his personal well-being.

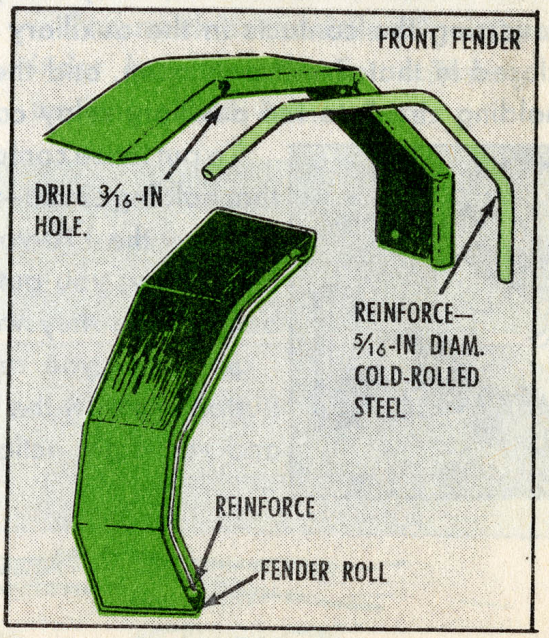
Clobbered cracks

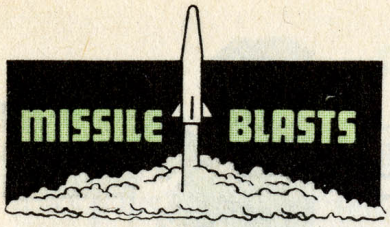


Cracks along the fenders of your G744-series 5-ton trucks, where the fenders bolt to the running boards, may be giving you a pain in the neck. If so, they're easy enough to fix.

Just look at TB 9-837-3 (2 April 53). It'll tell you how to weld the crack and bead weld some cold-rolled steel to that fender to keep it from cracking, because of vibration.

One thing to be careful of, tho. Never tighten those spring-loaded bolts and rubber washers to a point where their shock absorbing action will be cancelled out.





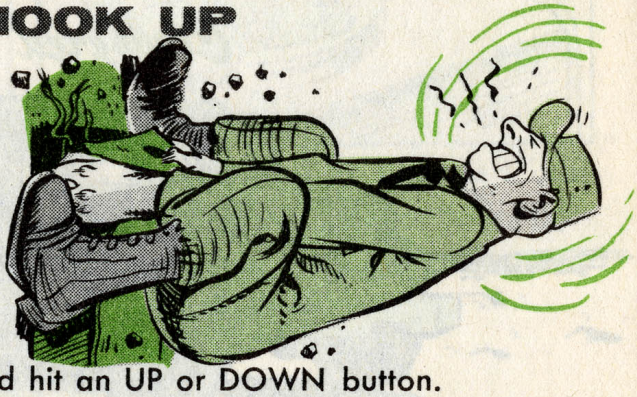
WATCH OUT FOR THESE...

PIT-FALLS

Keeping your Nike site hydraulic systems in tip-top shape is a running battle with valves, oil, switches, seals, and lots of other gear.

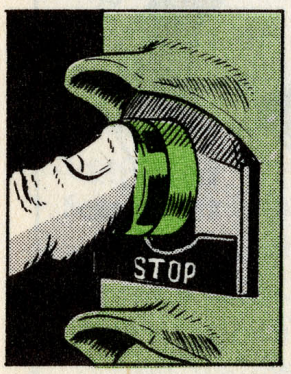
You've gotta keep a sharp eye for pit-falls in the pit that're waiting to trip up the operation. Run your eye over these to make sure you don't already have 'em . . . or be ready to fix 'em on the double if they happen to you.

ALL SHOOK UP



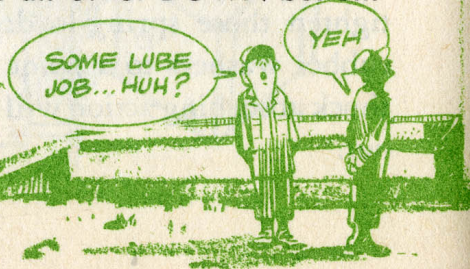
When either motor gets an overload, it trips the thermo overload relay in the 416-volt circuit. Every recruit knows there's a reset button on the cabinet to reset the thermo overload relay. But don't get all shook up and start tearing the cabinet apart if the motor won't run after you reset the overload switch and hit an UP or DOWN button.

The motor won't run because the overload relay does more than shut off the juice. It also causes the auxiliary relay in the 110-volt circuit to be energized, reversing the contacts in the auxiliary relay circuit. The contacts that're usually closed in that circuit pop open, and the open ones close . . . which completes a holding circuit to the auxiliary relay coil.



To put those contacts back where they should be—and break that holding circuit—you can do two things: Hit a STOP button... or throw the 110-volt switch off and then right back on again. Either way, you put the contacts in the auxiliary relay circuit back where they were before the thermo overload tripped.

So, after you reset the thermo overload . . . hit a STOP button or throw the 110-volt switch off and on. Do it that way, and you'll get action when you hit an UP or DOWN button.



MISSILE BLASTS

WATCH OUT FOR THESE...

PIT-FALLS IN THE PIT

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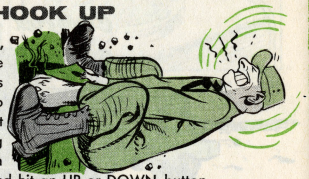

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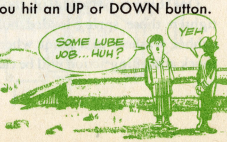
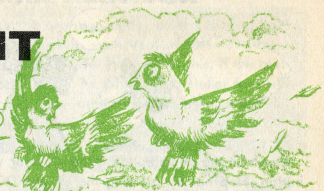
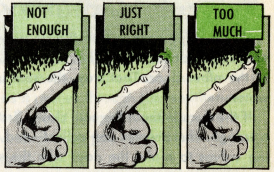


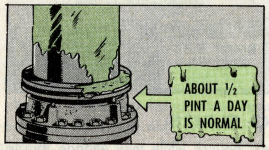


RUST ON YOUR PISTON

Your piston shouldn't be rusted or scored . . . and it shouldn't be dripping with oil. The finger test is the best way to see if you've got the packing gland on the main cylinder adjusted right.

Run your finger up the piston for about three feet. There should be enough oil on your finger to form a drop, but not a big enough drop to drip off. Another tip-off to wrong packing gland adjustment is the oil that runs off the wiper ring over the cylinder housing. With good adjustment, the oil loss amounts to a half pint per day during normal operation.





Too much or too little oil on the cylinder housing calls for adjusting the packing gland. Remember:

ALWAYS USE A .004 FEELER GAGE BETWEEN THE PISTON AND THE PACKING GLAND WHEN ADJUSTING.

Try to do the job without that feeler gage, and you could end up with a cocked gland. And with the gland in a cocked position, you get a scored piston.

IN THE PIT

RUST ON YOUR PISTON

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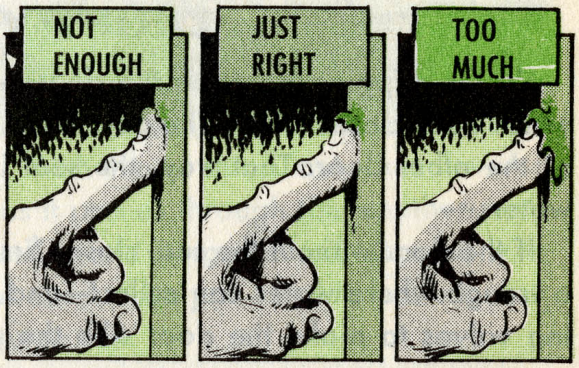

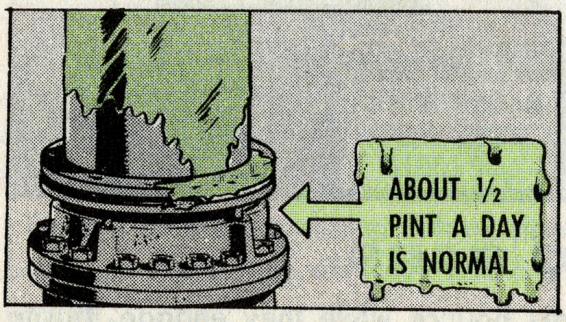

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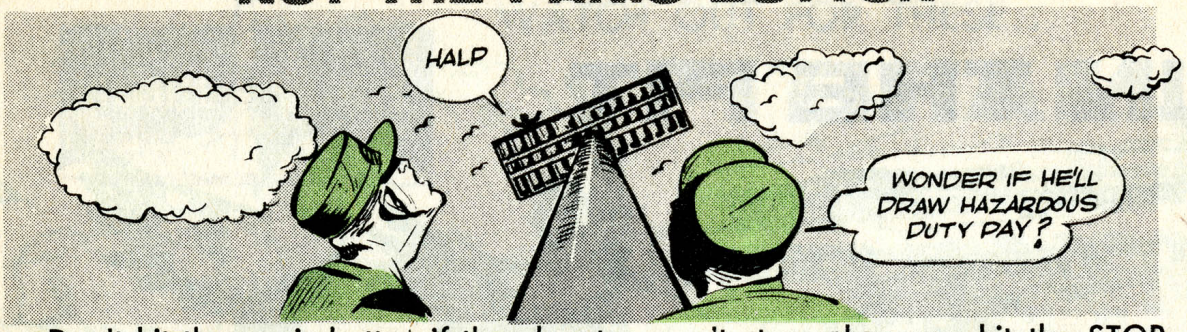
NOT THE PANIC BUTTON



Don't hit the panic button if the elevator won't stop when you hit the STOP button. Stop her by pressing the UP and DOWN buttons at the same time. Try the STOP button a couple more times. If it doesn't work right, holler for field maintenance.

DRIPPY DOORS

Water dripping between the doors when they're closed calls for a check on which door closes when. The door what has the seal should close a little ahead of the other door. That way, the seal is squeezed up in the air and keeps out water.

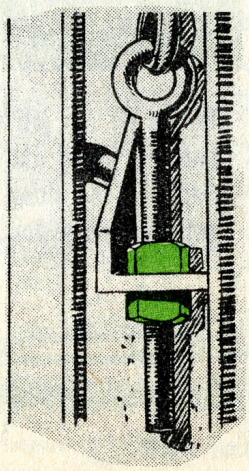
If the door without the seal closes first, the seal is squeezed down. That makes a trough where water can collect—and run down into the pit. Adjust the balancing valves to make the door with the seal close first.

BOUNCING BARS

Be quick on the uptake if the locking bars bounce while they engage. Hustle to the hydraulic cylinders and give 'em a quick air bleed. That'll keep things moving right . . . and could save a guide rail.

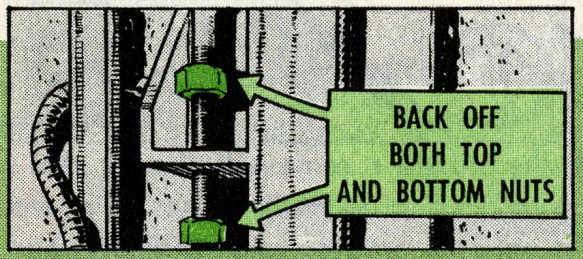
EYES WRONG

The adjusting eyebolts on the stabilizing assembly should be flat so they won't trip limit switches. Once you turn the eyes right, keep 'em that way. Put one lock nut on the eyebolt above the anchor plate and another lock nut below the plate. That'll keep you from getting eyes wrong. With just one nut—either above or below the anchor plate—the eyebolt can turn. It takes two.

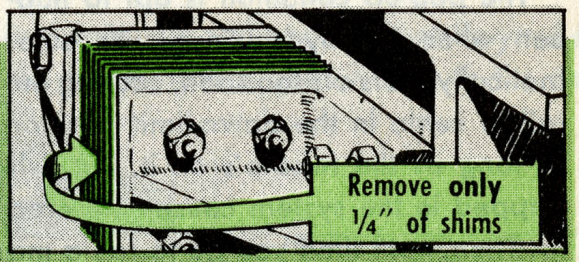


ROCK 'N' ROLL MISSILE

A missile doing the rock 'n' roll as the elevator settles on the locking bars means stop the music. (First run a quick check to see if the bolsters have been shimmed right so the elevator is level. Look in your manual for this. If the platform is twisted while resting on the lockin' bars, fix this up first. Holler for Field Maintenance if you need help.) Then adjust the stabilizing assembly so the elevator platform hits all four locking bars at the same time. Here's how:



Loosen the equalizing cables by backing off the nuts on the eyebolts.

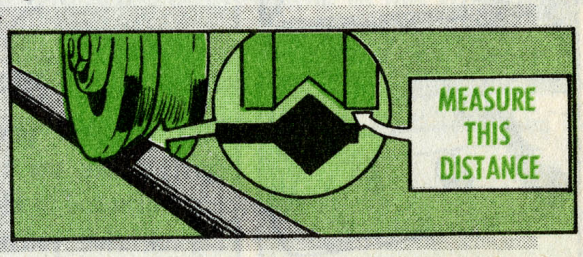


Remove the shims from each side of the guide rollers.

Run the elevator up on the locking bars. With those shims out, the elevator will automatically center itself on the bars as it pushes through the weather-seal.

Measure the clearance between each roller and its guide rail. Careful with that measurement, because it tells you how much shim you need to leave a 1/16-in clearance between each roller and its guide rail.

F'rinstance: If you get 9/16-in clearance between the roller and its guide rail with the shims removed, you need 1/2-in worth of shims to leave a 1/16-in clearance between each roller and guide rail with the shims installed.



Tighten all the equalizing cables equally until they cross 6 3/4 inches below the I-beam on the B-type elevator and 6 5/8 inches below the beam on the C-type elevator.

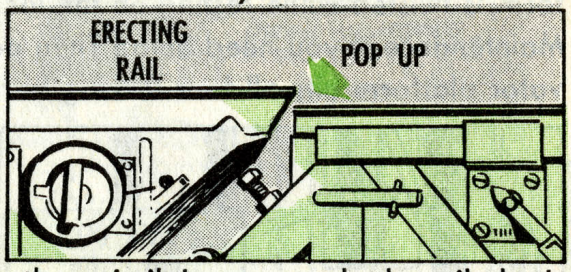
Raise the elevator and watch the platform as it settles on the locking bars. If it doesn't hit all four bars at once, keep playing the cable game. The rule for adjusting those cables goes like this: To tighten an end of a cable, you first loosen the opposite cable the same amount you want to tighten the first one.

Example: Let's say the left-front locking bar is the last one getting contact with the elevator. That means the left front part of the platform is high. To lower it, you loosen the top left cable and tighten the bottom left cable the same amount by turning the eye-bolt nuts on each the same number of turns. Use the same routine on all the cables until the platform hits all four locking bars at the same time.

Keep an eye on those pit-falls and your pit won't fall down on the job when she's needed most.

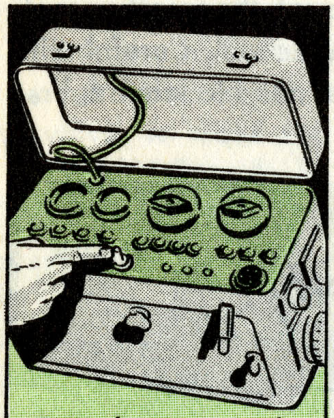
KEEP YOUR POP-UPS DOWN

If the erecting rail for your Nike-Ajax's No. 1 elevating launcher has developed a pop-up condition—that is, if it's raised an inch or so beyond what it should be to be even with the rest of the side racks—you've got a little adjusting to do.

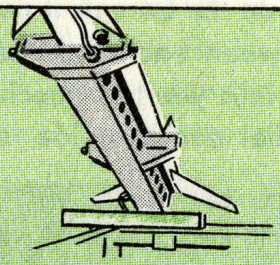


The pop-up condition is apt to happen when the hydraulic power automatically shuts off too soon, causing the rail to settle in the down-limit position as long as the missile's on it. But, when the missile's removed, the oil that's trapped in the system causes the erecting rail to pop up when it's not supposed to. Then, next time you go to roll a missile onto the erecting rail, the wheels and axles'll be hurtin', and the transporter-rail missile-booster combination'll be given a good jolt.

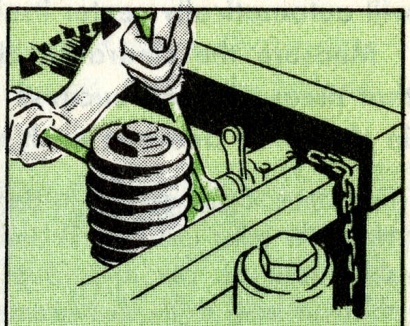
To correct a pop-up condition once you've got it, here's how to do the job:



Raise the erecting rail.

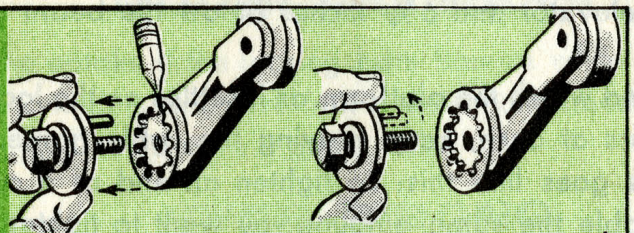


Turn off your power, and for safety's sake, use a 4x4 or other piece of wood to block the erecting rail while you're working under it.

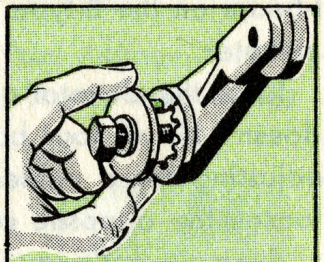


Use a socket wrench and remove the cap screw on the adjusting arm of the down-limit switch.

Carefully pull straight out, with your fingers, the washer and locator pin located behind the cap screw.



Make sure you've marked the hole where you started (a pencil'll do the trick). Once you lose your place, you'll have to test each hole separately until you find the right one.



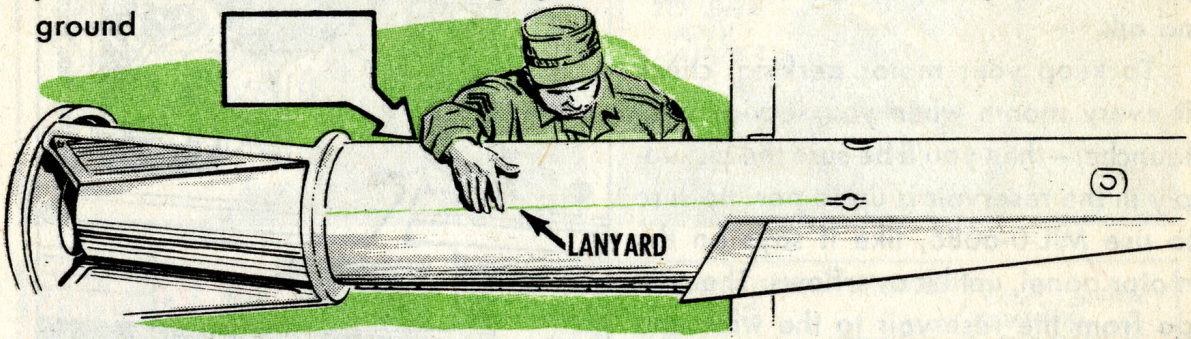
Turn pin one hole counterclockwise from where it was to begin with.

Replace the pin and the cap screw, turn the power back on and work the down-limit switch to see if the rail settles all the way down. If it doesn't, you'll have to go back and move the pin one more hole counterclockwise and try it again. You may hafta move the pin a coupla more times before you hit it.

UNH, UNH, DON'T TOUCH

Maybe you've got a friend who isn't on the ball, and maybe he makes it a habit of pawing all over the separation lanyard on the Nike missile. And maybe he tries to use the lanyard to pull himself on top of the missile whenever he's got some PM to do. And maybe, one o' these days, your CO'll be sending the guy's dog tags to his next-of-kin.

Could be, if all the conditions are just right. A good yank on that lanyard and your whole outfit could be singing the blues—with a golden harp in the background



You know the set-up . . . the lanyard is connected to the power plant pressure regulator valve and the fitting on the thrust structure. There's a spring loaded pin on the missile above the valve. Comes a good yank on the lanyard and it'll pull the retaining pin at the forward end of the rod from the hole in the spring-loaded activating pin of the pressure regulator valve.

When that happens, the missile'll start to pressurize itself, and if the overboard dump port isn't open to let the pressure out . . . whoosh! One mighty big bang from that missile.

So, to be on the safe side, be real careful to keep from hanging or pulling on the lanyard.

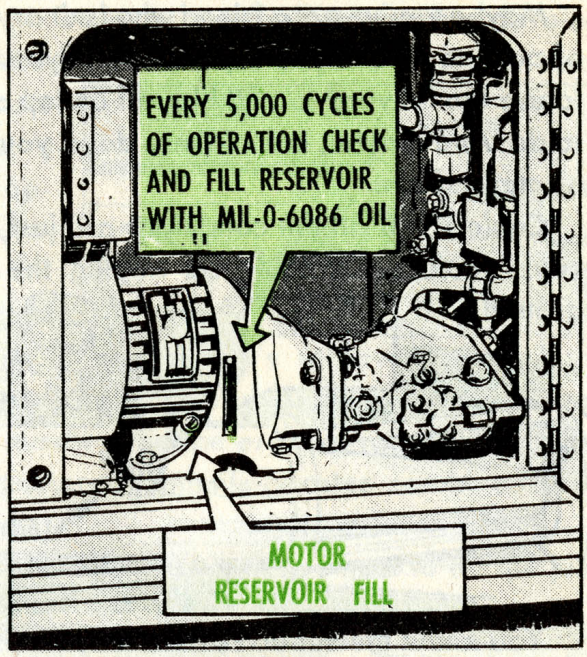
KEEP 'EM COATED

As every good maintenance-minded Joe knows, coating battery and cable terminals with a thin layer of grease helps keep 'em from corroding. A battery that's gloppy is often worse than no battery at all.

Same holds true for the BB401/U batteries in your Nike-Ajax missiles. You've got to make sure they stay clean and free from grit **all** the time. Try putting a real thin coat of Insulating Compound, electrical, FSN 5970-224-5277 (2 oz) (DC-4 for instance) on the cable terminals and battery posts and cell connectors—it'll do the job just fine.

KEEP 'ER FULL

How long has it been since you filled the pump motor on your Nike-Ajax launcher combined hydraulic power package? If you've been hearing noises, like pieces of metal tearing each other to bits, it's been **too** long, cause a noisy pump motor usually means one thing—no oil.



To keep your motor perking, check it every month when you service your launcher—then you'll be sure the oil supply in the reservoir is up to par. Be sure to use MIL-0-6086, like it says on the motor panel, until it overflows. The oil'll go from the reservoir to the wick and your motor'll be able to do its job.

Calling name for this oil is: Lubricating oil, gear—FSN 9150-223-4130 gets you 1 gallon of medium grade.

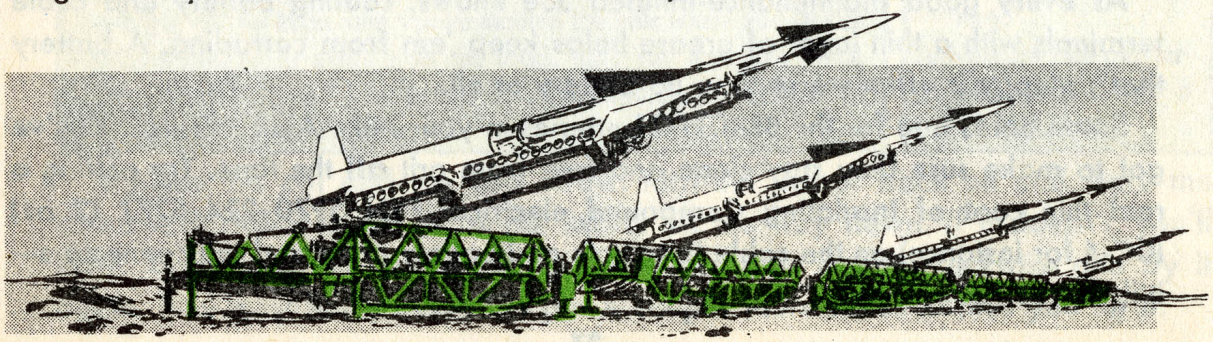
If you wait until your motor's really dry before adding any oil, you might have to get a whole new motor—and that means lots more sweat than just adding oil.

DERRICK DOINGS

The pages toward the end of FM 44-33A—the ones that start at paragraph 106—should be looked at long and hard when you M33 FCS and Nike-Ajax guys start to use the acquisition antenna derrick.

A lotta things can go wrong with the derrick when you're setting up the antenna unless you keep shooting look-sees at the FM.

If the derrick acts up even tho you do everything according to the FM and Sergeant Hoyle . . . then's the time to fire away with a UER.



JOE'S DOPE
LUMINOUS
FACTS ABOUT BLACKOUT DRIVING
FIRST OFF, BEFORE WE BEGIN, SUPPOSE YOU ADJUST YOUR EYES TO THE DARK BY SIMPLY STARING AT THIS BLACK PANEL...
THERE, NOW... YA BEGINNING TO SEE ANY SHAPES?
YEOW!
BACK UP, JACKSON... YOU'VE RUN ONTO THIS CAT'S FOOT...
ULP... SORRY CONNIE... I HAVE AN AWFUL TIME GETTIN' THE HANG OF THIS BLACKOUT DRIVING BUSINESS.
BETTER LEARN IT THEN... IN COMBAT OR IN ZI MANEUVERS BLACKOUT DRIVING MAKES YOU A MIGHTY POOR TARGET FOR SOME ENEMY HOWITZER IN THE NIGHT.
SURE, HE MAY BE ABLE TO HEAR YOU BUT A GOOD BLACKOUT MANEUVER CAN DRAW THE BLINDS ON HIM UNTIL YOU'RE SAFELY OUT OF RANGE!

FOR THIS REASON MILITARY VEHICLES ARE EQUIPPED WITH BLACKOUT LIGHTS AND MARKERS.

FRONT B.O. MARKER

BRAKE LIGHT

REAR B.O. MARKER AND B.O. BRAKE LIGHT

B.O. DRIVING LIGHT

BLACKOUT DRIVING IS TOUGH . . . WHETHER IN ZI OR IN COMBAT SO—KEEP THIS IN MIND WHEN Y'R READY TO TAKE OFF

1 IT'S ROUGH ON NERVES . . . BE READY FOR ANYTHING.

2 IF YOU HAVE POOR NIGHT VISION TAKE **EXTRA** CARE

3 WATCH FOR PEOPLE WALKING AROUND . . . YOU MAY NOT SEE 'EM 'TIL THEY'RE TOO CLOSE FOR SAFETY

4 TAKE CUES FROM OFF-BEAT THINGS LIKE THESE—

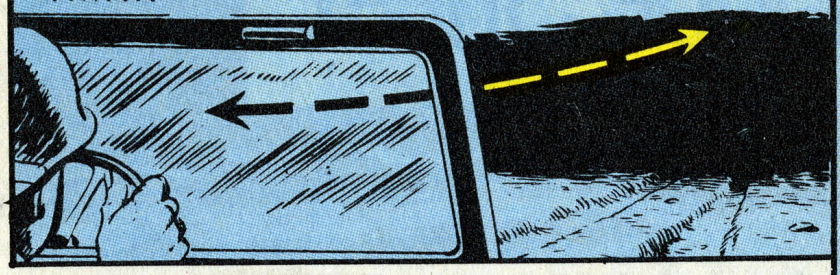
YOUR OLD FRIENDS, THE ROAD SIGNS, WILL BE INVISIBLE MOST TIMES

5 **CAREFUL . . . CAREFUL . . . CAREFUL** KEEP YOUR SPEED DOWN! STAY ON THE BALL—DANGER OF ACCIDENTS IS DOUBLE UNDER BLACKOUT CONDITIONS

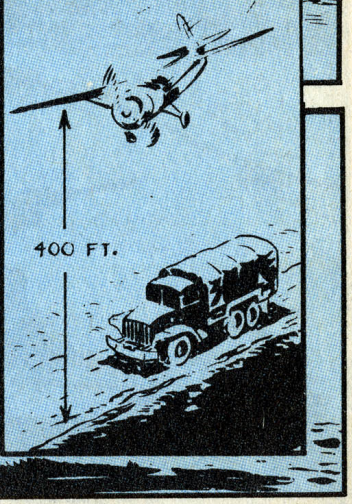
6 YOUR GREATEST FRIENDS DURING BLACKOUT DRIVING (IN CONVOY ESPECIALLY) ARE YOUR BLACKOUT MARKER LIGHTS, FRONT AND BACK

HERE'S HOW TO READ B.O. MARKERS...

FIRST, REMEMBER THAT THEY'RE NOT DESIGNED TO LIGHT UP THE ROAD . . . JUST PINPOINTS OF LIGHT TO GUIDE YOU . . . THEY'RE VISIBLE UP TO 800 FT. AWAY.



THEY'RE MADE SO PLANES FLYING OVER 400 FT. ABOVE YOU CAN'T SEE 'EM...



SO . . . THE PRIME JOB OF BLACKOUT MARKERS IS TO TELL YOU HOW FAR OR CLOSE YOU ARE TO THE NEXT GUY . . . WITHOUT TIPPING YOUR HAND TO THE ENEMY . . .

HERE'S WHAT YOUR **REAR** B.O. LIGHTS MEAN

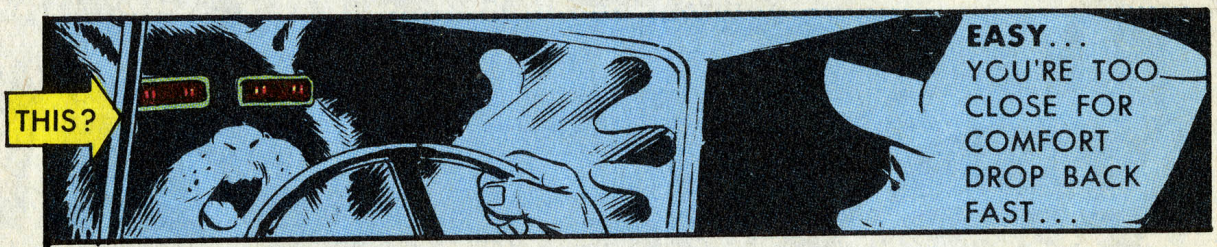
IF YOU SEE THIS

YOU'RE PRETTY FAR BACK ...Y'CAN GET CLOSER

IF . . .

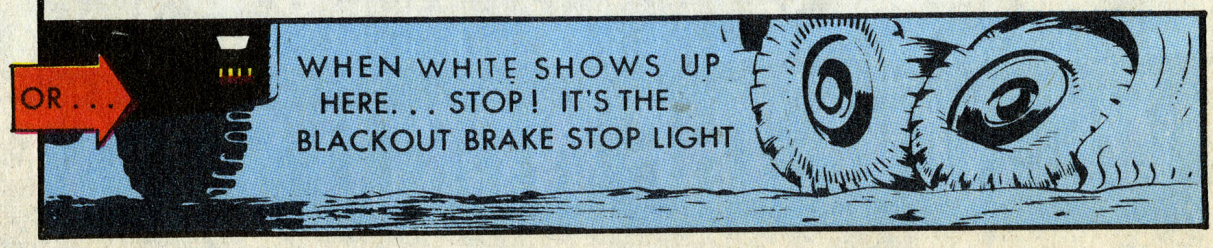
YOU'RE OKAY . . . ABOUT 60 FT. **AWAY**

THIS?



EASY... YOU'RE TOO CLOSE FOR COMFORT DROP BACK FAST...

OR . . .



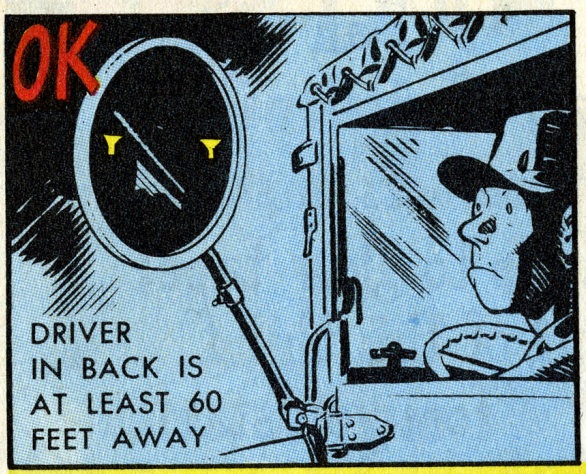
WHEN WHITE SHOWS UP HERE. . . STOP! IT'S THE BLACKOUT BRAKE STOP LIGHT

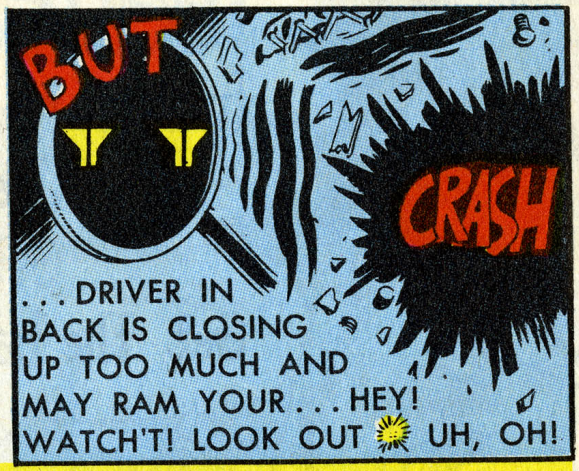
JOE'S
Dope Sheet
WE HAVE THE WORLD'S BEST EQ

JOE'S Dope Sheet
Blackout driving's a skill and an art,
In warfare - an integral part -
Keep markers in shape;
Get hip to glow tape;
Get the hang of this thing 'fore you start.
WE HAVE THE WORLD'S BEST EQUIPMENT... Take care of it

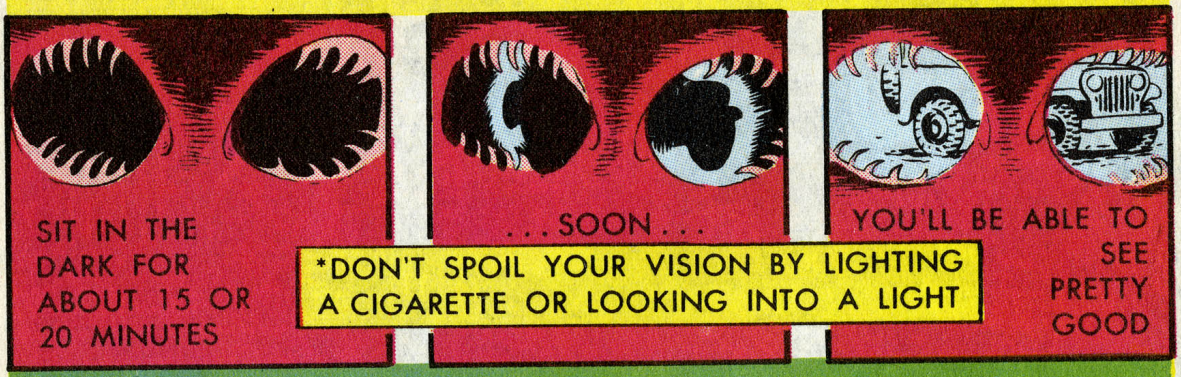
QUIPMENT... *Take care of it*

THOSE **FRONT** BLACKOUT LIGHTS ARE A BIT DIFFERENT, BUT THEY OPERATE THE SAME WAY...YOU LOOK THRU YOUR REAR VIEW MIRROR AND CALCULATE DISTANCE LIKE THIS...

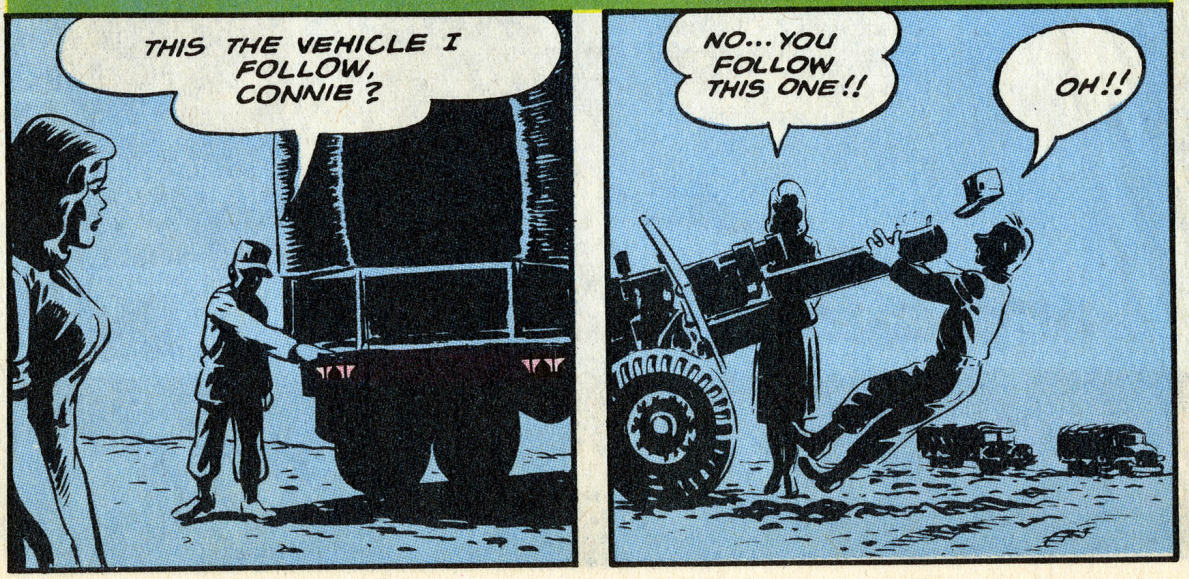


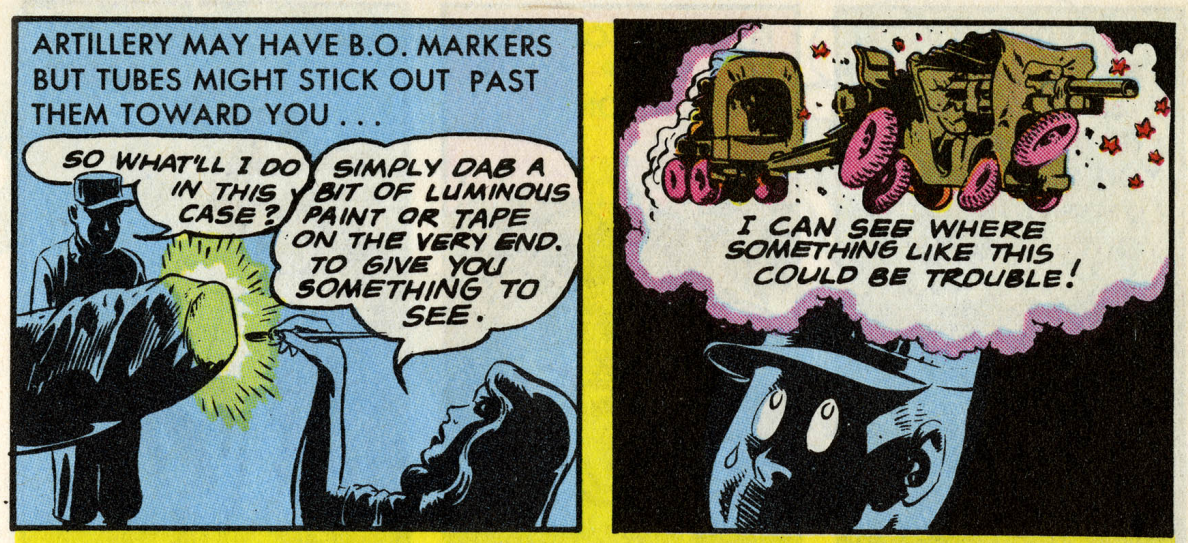


BEFORE TAKING OFF ON BLACKOUT DRIVING, GET YOUR EYES READY FOR IT LIKE THIS



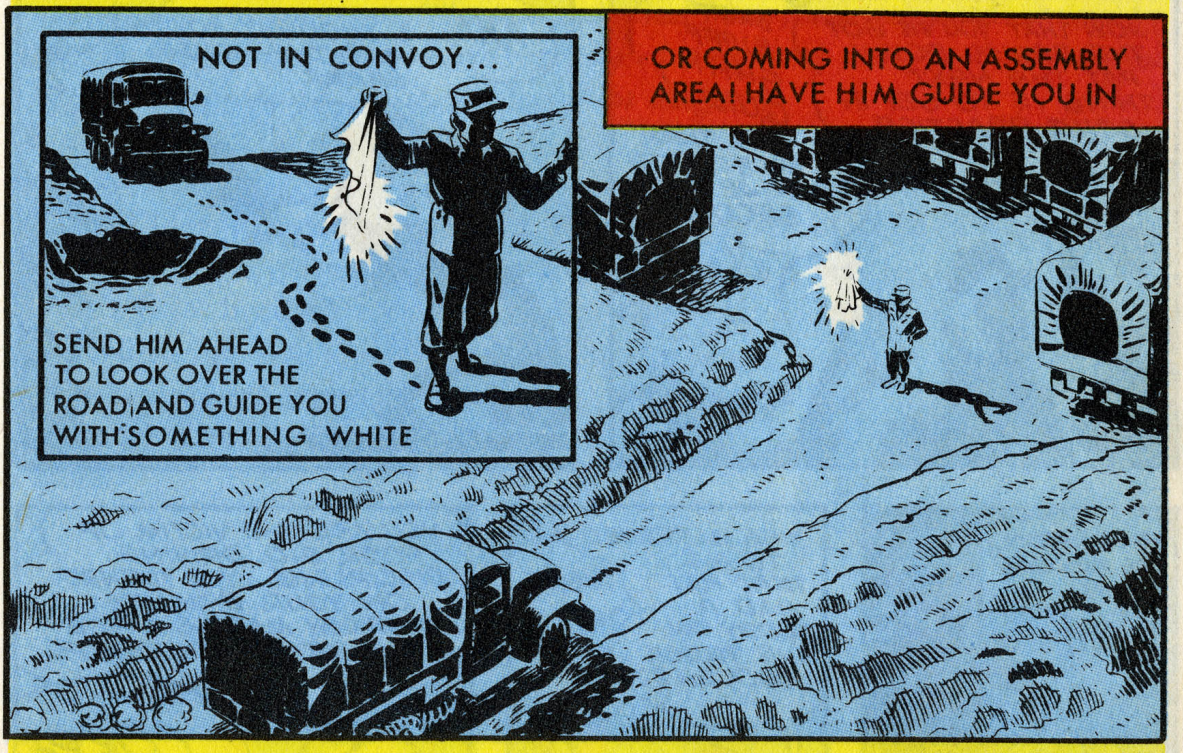
GET CLUED ON WHAT'S AHEAD OF YOU

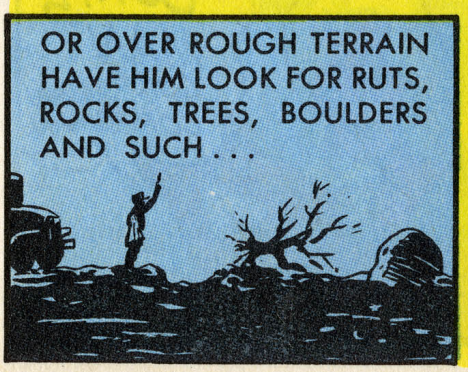




HOW TO USE AN ASSISTANT DRIVER

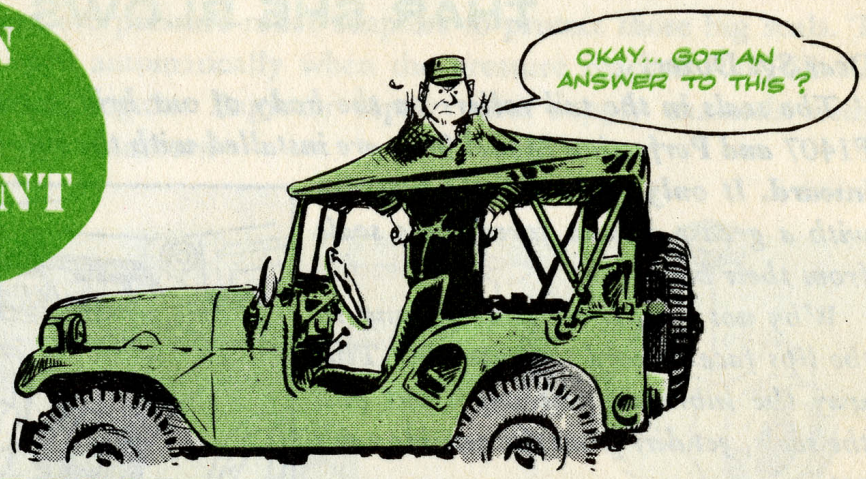
(AND YOU SHOULD HAVE ONE FOR B.O. DRIVING)





YOU MIGHT NOT SEE THE ROAD...OR EVEN THE GUIDE... BUT AS LONG AS YOU CAN SEE THAT LUMINOUS PAINT YOU'RE IN BUSINESS.
BUT...IF YOU LOSE IT...STOP YOUR TRUCK AT ONCE...
SCREECH
WHY...? WELL, BECAUSE
NOW THAT YOU'VE GOT THE BASICS DOWN PAT THE NEXT THING IS TO GET IN SOME PRACTICE.
SNIFF SNIFF SHHH QUIET! I'LL TURN ON MY BRIGHTS FOR JES' A SECOND.
AHA... I THOUGHT SO. HARRY-THE-MOUSE GRRRR
RUN, HARRY. I'M ZEROED IN.
WHA HAPPENED TO ME... THAT RAT HAD A BUDDY ON THE TRUCK BED, EH??
RIGHT.
YOU ARE THE VICTIM OF POOR B.O. DRIVING DISCIPLINE... YOU TURNED ON YOUR BRIGHTS THEREBY MAKING A FINE TARGET OF YOURSELF...
CORPS MAN CORPSMAN CORPSMAN

QUESTION AND ANSWER DEPARTMENT



PRESERVE YOUR TOP

Dear Half-Mast,

What can we do about preserving the canvas tops for Jeeps? Ours are rotting out in about a year. They get cleaned at best every month, and cleaned good. But they just rot out on us. The sun and wind have their way, and rot 'em by the end of the year. I think if we reprocessed them with some kind of solution every time we cleaned 'em they'd last a lot longer.

Sgt E. D. B.

Dear Sgt E. D. B.,

Try Mildew Resistant Compound, FSN 8030-286-3221 (QM). That number will give you five gallons of the concentrated—which is best for OI

Use a paint brush or spray gun and give it about 24 hours to dry and you'll have a first-rate job. There's some mixing involved, so follow the instructions on the can right down to the last period.

When it's put on right, that compound will put the clamp on rot for many a moon.

Half-Mast

WHICH CABLE?

Dear Half-Mast,

What's with the winch cable in the G-741 vehicles? TM 9-8030 calls for 7/16-in cable, but Ord 7 SNL G-741 dated January 1957 calls for ½-in cable. Which is right?

Mr. C. C.

Dear Mr. C. C.,

You use the ½-in cable. Generally, whenever there's a discrepancy between a TM and SNL, you'll go by the SNL (or the new Parts Lists what'll come in TM's). On accounta the TM is instructional, but the SNL is the authority for issue. So your support people would have to issue you the ½-in cable—there's no authority to give you 7/16-in stuff.

Half-Mast

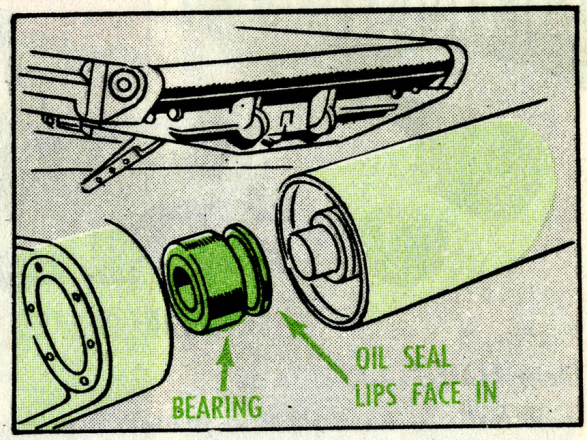
THAR SHE BLOWS

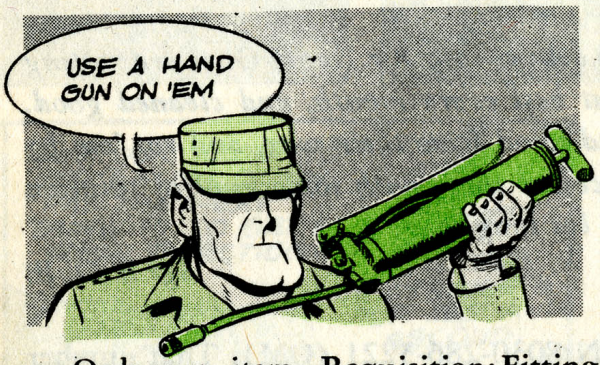
Dear Sgt Dozer,

The seals in the tail rollers on the body of our bridge trucks, Hobbs Model F1407 and Perfection Model 902, are installed with the lips of the seals turning ***inward.*** *It only takes a little pressure with a grease gun to force these seals from their base.*

Why not turn these seals around so the lips face toward the ***outside?*** *This way the lubricant can work out past the seals, yet dirt from the outside can't get in.*

Mr. J. B.





Dear Mr. J. B.,

Turning those seals around will keep them from "blowing", but a pressure-relief type lube-fitting on that rear roller will work better. It'll blow before the seal does. That fitting's an Ordnance item. Requisition: Fitting, lubrication, pressure relief type, 1 to 5-PSI, ⅛-27NPTF, extra short male, FSN 4730-330-0111.

There won't be any blown seals if the lubing's done according to Hoyle. Use a hand gun on those rollers, and take it easy. Overlubrication can sometimes cause as much trouble as not enough lube.

Sgt Dozer

BY HAND OR BY AIR

Dear Sgt Dozer,

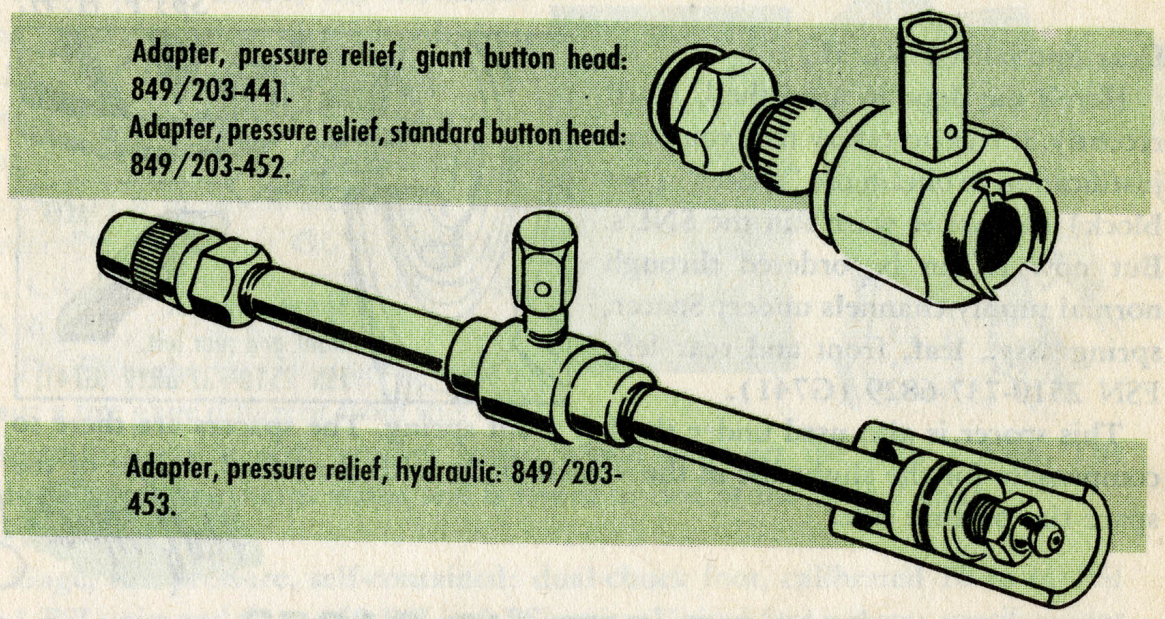
We had to replace the leather seal on a dozer bottom track roller because a new guy lubed it with a compressed-air lubricator. Naturally, he was supposed to pump the lube in with a grease bucket. The blown seal caused us to start looking around for a publication or directive that tells you where and when to use pressurized lubricators, hand guns, etc. So far, we've found nothing.

Cpl C. T.

Dear Cpl C. T.,

There's no pub on what gun to use on all lubrication fittings. Getting one out would be like listing all the hands it's possible to get in a poker game and telling how to play each hand. A real long book.

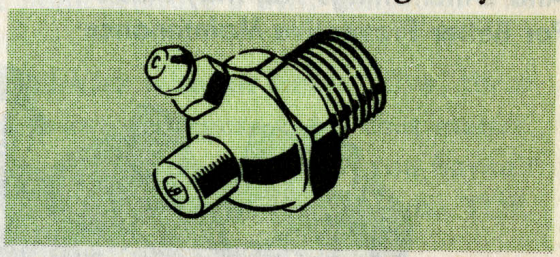
What you need are pressure-relief adapters to protect those big seals. These three adapters open automatically when the pressure reaches 500-PSI. Requisition 'em through regular Engineer repair parts supply channels with the manufacturer's part numbers.



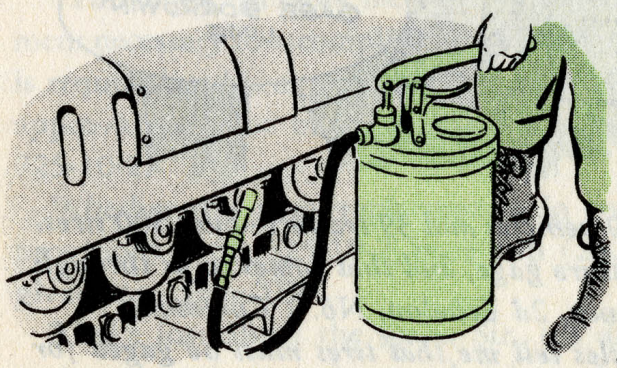
Adapter, pressure relief, giant button head: 849/203-441.
Adapter, pressure relief, standard button head: 849/203-452.

Adapter, pressure relief, hydraulic: 849/203-453.

For smaller seals, there are two pressure-relief-type lubrication fittings that open at real low PSI. They're Ordnance items. FSN 4730-330-0111 gives you a fitting that automatically opens at 1 to 5-PSI. FSN 4730-506-1610 is for a fitting that opens at 15-PSI. Get 'em to protect seals that blow easy.



Now, about that information on where to use what kind of lubricator. Some of it is in the lubrication sections of heavy equipment TM's. Those sections usually show parts being lubricated. You can check the pictures and find out which gun to use on each lubrication fitting. Look at TM 5-3040 B, page 56, Ref. 37. It shows a bottom track roller being lubricated with a bucket.



But the best thing you have to go on is experience—old hands who know all the in's and out's of lubrication. Every new man in the outfit ought to be trained by them. Naturally, that goes for any maintenance or operating job.

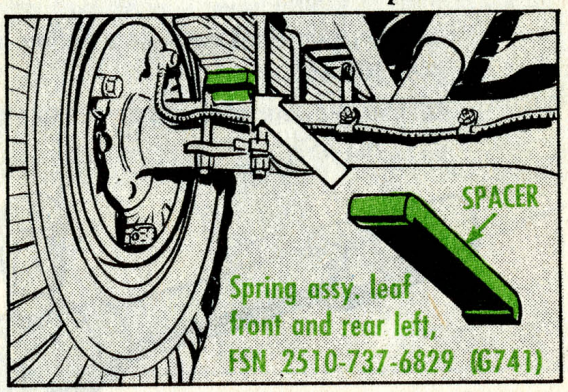
Sgt Dozer

SPACE FOR THE "SPACER"

Dear Half-Mast,

Could you tell me the nomenclature and just how I can requisition the block found between the left rear spring and axle housing on the M43 ¾-ton ambulance, and where is this in black and white?

Sp3 F. H. H.



Dear Specialist F. H. H.,

Here's the dope in a nutshell. Until recently, it was necessary that you have justification to obtain the "spacer" (not block) because it wasn't in the SNL's. But now it can be ordered through normal supply channels under: Spacer, spring assy., leaf, front and rear left, FSN 2510-737-6829 (G741).

This spacer is also used under the left front spring. The spacers are there to compensate for the slight list in the vehicle body with the added weight of the spare tire on that side.

Half-Mast

HOW TO GET AIR GAGES

And Other Things You May Need For Better Preventive Maintenance

Dear Half-Mast,

Get this—my battalion's authorized 69 vehicles and 39 trailers—over 500 tires. Yet, our TOE calls for just one tire pressure gage, and that comes to us through one Tool Set, Organizational Maintenance, 2d Echelon, No. 1 Common.

The TM's for every one of my vehicles tell me that tires must be gaged for correct pressure every day (before operation) and at every biweekly service. How far do they expect one tire gage to go?

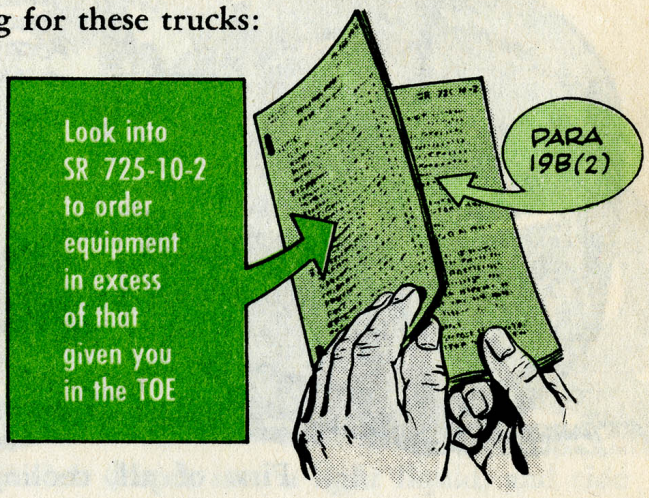
Maj L. P. H.

Dear Major L. P. H.,

Sir, you've got a problem, but there's a way you can get around it.

First off, SB 9-116 (25 Mar 55) gives you the authorization to requisition tire pressure gages for those vehicles that are equipped with a tire inflating hose. The SB tells you to requisition the following for these trucks:

Gage, tire pressure, self-contained: For general testing air inflated tires, calibrated 10 to 160-lb range, 1-lb smallest graduated div, 30 deg mtg angle, dual foot type w/deflector and extension, 6 in lg, in accordance with Federal Specification GG-G-91a Type II, Class A, Style 2, FSN 4910-244-4556.



The SB authorizes issuing agencies to issue a tire gage different from this one, except to units in zero weather zones, which must get the Style 2 gage. The other gage is in exhaust status and is issued in lieu of the Style 2 gage.

This gage is—

Gage, tire pressure, self-contained: dual-chuck foot, calibrated 10 to 60-PSI in 1-PSI units and 60 to 160-PSI in 5-PSI units: United States Army specifications 56-50-5 Type II FSN 4910-261-8410.

Now, in checking the SB, you'll find the nomenclature a little different. The names above are the **latest.**

That takes care of your tactical wheeled vehicles with air hoses. Now, there are other ways you can use to get more tire pressure gages or, for that matter, any other piece of equipment authorized by your TOE but of which you haven't got enough—and must order in excess to what you're authorized by the TOE.

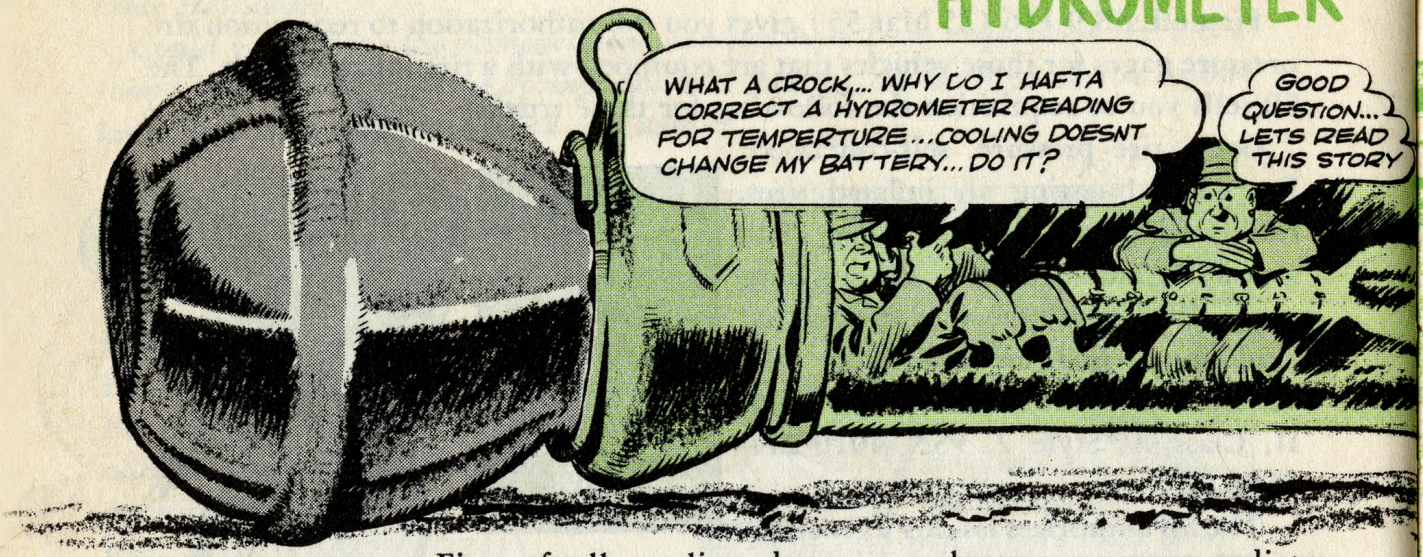
First. . . many TOE's state the following in their introduction:

"This table contains the **minimum** essential quantities and types of equipment necessary to accomplish the mission of the unit. When additional equipment is required and is not covered by pertinent equipment authorization documents, approval must be obtained in accordance with procedures established in SR 725-10-2."

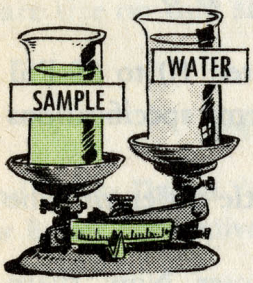
Whether this paragraph appears in your TOE or not, you can still use the provisions of SR 725-10-2, para 19b (2), to order equipment in excess of that given you in the TOE.

That's just about the score, Sir. It's directives like this that get people the tools and equipment they need to keep their maintenance up to par.

HYDROMETER

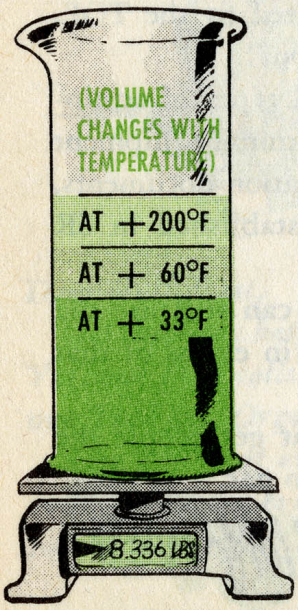


First of all, cooling down your battery—or your radiator, either—does not change the mixture of water and acid in the cells, nor the mixture of water and anti-freeze in the radiator. After all, you haven't added anything, nor taken anything away.



But here's the snapper: You measure these solutions in terms of "specific gravity." In other words, you are comparing the **weight** of an exact **volume** of your sample with the **weight** of an exactly equal **volume** of water. And that's where the need for temperature correction comes in.

WATER—MORE OR LESS

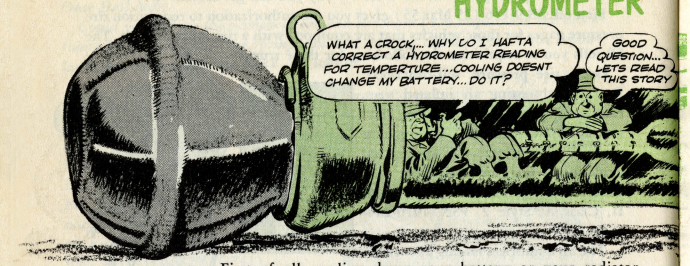


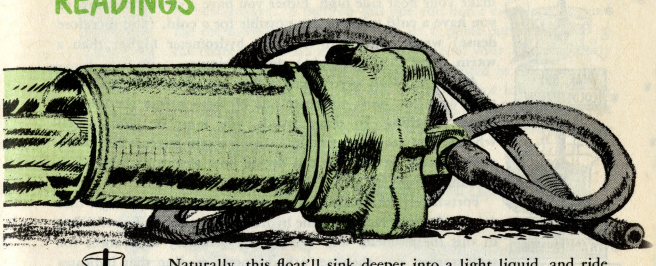
(WEIGHT STAYS SAME)

You see, 8.336 pounds of water equals one gallon **at 62° F.** That's the accepted standard. But, if you cool that jug of water down to almost freezing, it'll still weigh 8.336 pounds, but since it **contracts** with the cold, it'll no longer be exactly one gallon. Same way if you heat it up to just below the boiling point. You'll still have 8.336 pounds, but it'll have **expanded** until you have a little **more** than a gallon. In other words, water becomes **denser** as it cools, **thinner** when warmed up.

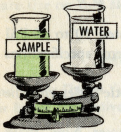
OK, now you know that an object floating in a liquid will sink down into that liquid until it has pushed aside—"displaced" they call it—exactly its own **weight** of that liquid. So your hydrometer has a float, weighted to hold it vertical, and calibrated to show how far it has settled into the liquid you're testing.

HYDROMETER READINGS



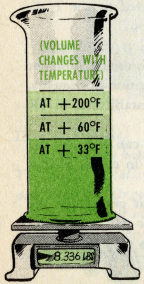


First of all, cooling down your battery—or your radiator, either—does not change the mixture of water and acid in the cells, nor the mixture of water and anti-freeze in the radiator. After all, you haven't added anything, nor taken anything away.



But here's the snapper: You measure these solutions in terms of "specific gravity." In other words, you are comparing the **weight** of an exact **volume** of your sample with the **weight** of an exactly equal **volume** of water. And that's where the need for temperature correction comes in.

WATER—MORE OR LESS



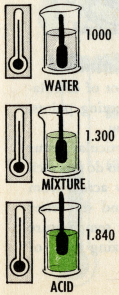
You see, 8.336 pounds of water equals one gallon **at 62° F.** That's the accepted standard. But, if you cool that jug of water down to almost freezing, it'll still weigh 8.336 pounds, but since it **contracts** with the cold, it'll no longer be exactly one gallon. Same way if you heat it up to just below the boiling point. You'll still have 8.336 pounds, but it'll have **expanded** until you have a little **more** than a gallon. In other words, water becomes **denser** as it cools, **thinner** when warmed up.

OK, now you know that an object floating in a liquid will sink down into that liquid until it has pushed aside—"displaced" they call it—exactly its own **weight** of that liquid. So your hydrometer has a float, weighted to hold it vertical, and calibrated to show how far it has settled into the liquid you're testing.

Naturally, this float'll sink deeper into a light liquid, and ride higher out of a dense liquid.

So here's the joker: That float will measure the **actual** density of the solution you float it in, but it won't take the temperature into consideration. This means that if you had a sample of pure water at just below boiling point and took it out into a cold shop you could take hydrometer readings every half hour as the water cooled off, and you'd get a **different** and **higher** reading every time. And yet you'd know the sample was the same—only the temperature was different.

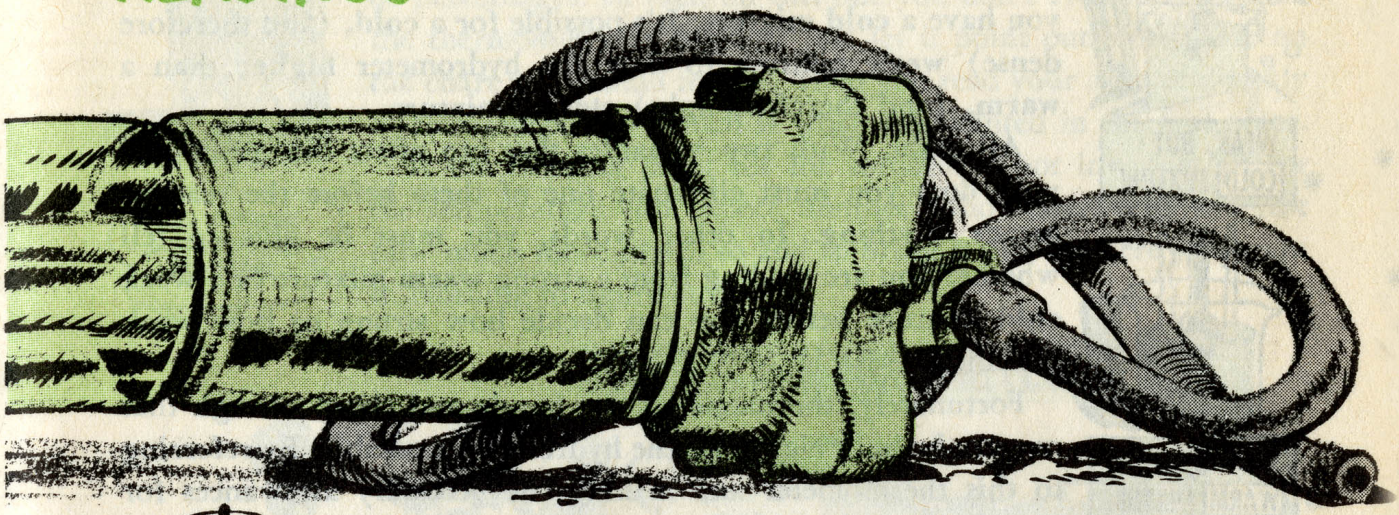
TWO VARIABLES

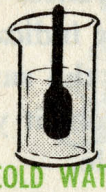


Now, let's look a little deeper into this problem. When you take a hydrometer reading on a battery you want to know the percentage of free acid in the electrolyte, because that'll give you an indication of the state of charge of the battery. When you sample your radiator coolant you want to know the percentage of anti-freeze in the water so you can tell the freezing point of the solution.

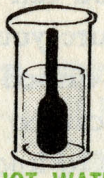
In either case, you'll determine this percentage by comparing the density of the mixture to the density of water. Both sulphuric acid and ethylene-glycol are denser than water, so your float'll ride higher in the mixture, and the stronger the mixture is—which also means the denser it is—the higher the float'll ride.

READINGS





COLD WATER

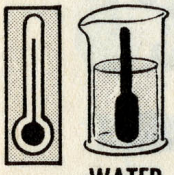


HOT WATER

Naturally, this float'll sink deeper into a light liquid, and ride higher out of a dense liquid.

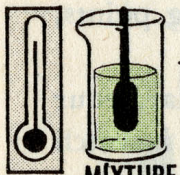
So here's the joker: That float will measure the **actual** density of the solution you float it in, but it won't take the temperature into consideration. This means that if you had a sample of pure water at just below boiling point and took it out into a cold shop you could take hydrometer readings every half hour as the water cooled off, and you'd get a **different** and **higher** reading every time. And yet you'd know the sample was the same—only the temperature was different.

TWO VARIABLES



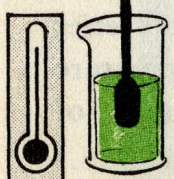
1000

WATER



1.300

MIXTURE

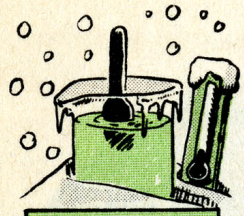


1.840

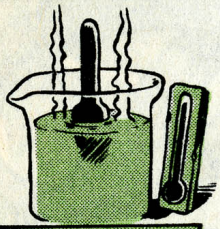
ACID

Now, let's look a little deeper into this problem. When you take a hydrometer reading on a battery you want to know the percentage of free acid in the electrolyte, because that'll give you an indication of the state of charge of the battery. When you sample your radiator coolant you want to know the percentage of anti-freeze in the water so you can tell the freezing point of the solution.

In either case, you'll determine this percentage by comparing the density of the mixture to the density of water. Both sulphuric acid and ethylene-glycol are denser than water, so your float'll ride higher in the mixture, and the stronger the mixture is—which also means the denser it is—the higher the float'll ride.



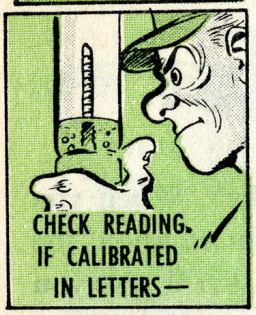
WEAK, BUT COLD MIXTURE *

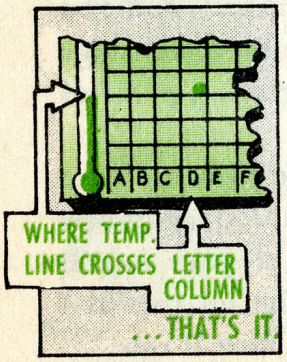


STRONG, BUT WARM MIXTURE *

* NOTICE HEIGHT OF BOTH FLOATS

TO MAKE PROPER ADJUSTMENTS IN READINGS...





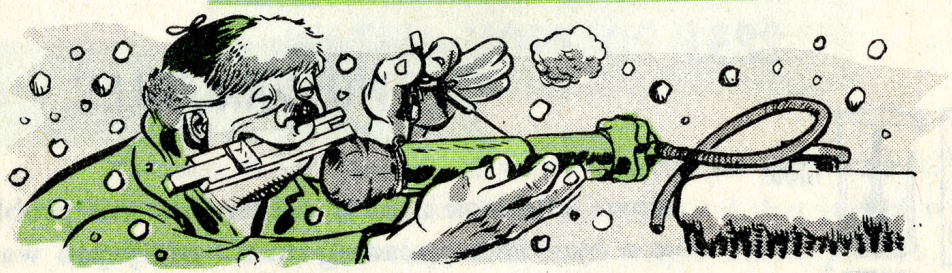
Fine deal, but you see, you now have two variables that'll make your float ride high. Either you have a **strong** mixture, or you have a **cold** mixture. It's possible for a **cold,** (and therefore dense) **weak** mixture to float the hydrometer **higher** than a **warm,** (and therefore light) **strong** mixture.

All right. With **two** variables that can affect the reading of your float you must eliminate one of them before the reading means anything. In other words, you must be able to tell whether you are reading from a strong **warm** mixture or a weak **cold** mixture before you can decide how strong or how weak the mixture is.

Fortunately, thermometers are handy and cheap enough that one can be built right into the hydrometer assembly. By referring to this thermometer and making the necessary allowances for temperature, you then get a hydrometer reading that indicates the density of your sample as compared to water **at the same temperature.** This is the figure you need, because from it you can tell how much acid or anti-freeze is in your sample.

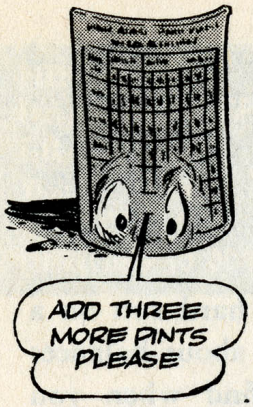
There you have the principles of the thing, and you can see why you **must** consider the temperature of the mixture you're testing. Only by allowing for the variation in density caused by temperature can you find the variation in density caused by the strength of the solution, which is what you want to know.

RADIATOR HYDROMETERS



Before you get all shook up worrying about a lot of calculations for temperature, density, specific gravity, freezing points, etc. Relax. Most of it has already been done for you.

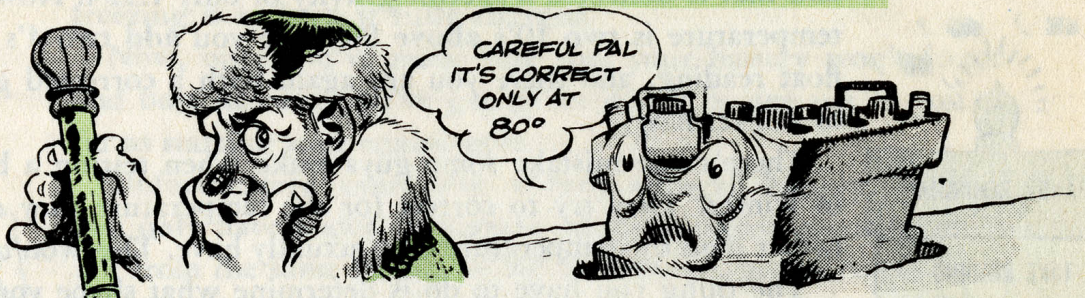
In the case of the radiator hydrometers in particular, your float is generally calibrated in letters. All you have to do is watch the thermometer until it settles down, then follow across from the top of the thermometer column until you find the letter that's just above water on your float. Where that temperature line crosses that letter column, you'll find the freezing point of that radiator all figured out for you.



You never have to bother your head about specific gravities, or percentages. In fact, on this one you don't even have to read the thermometer in degrees. Just let it point out which line on the chart you should follow. Then you read your answer directly in freezing points—which is what you wanted in the first place.

If the freezing point for the solution is not low enough for the temperature you expect, another handy chart tells you just how much more glycol to add to bring it down where you want it. Nothing to figure out.

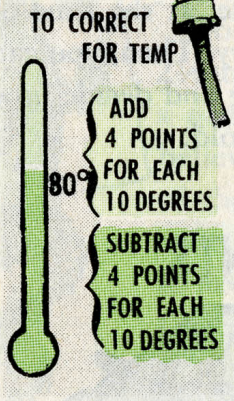
BATTERY HYDROMETERS



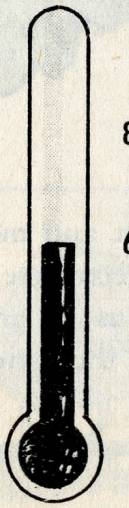
With the battery hydrometer, it's a little more complicated, but not much. Your float reads in specific gravities. But its markings are correct only at 80° F.

To correct for temperature you read the thermometer on the hydrometer. Then for every **ten** degrees below 80°, you **subtract four** gravity points from the specific gravity reading you got. Or for every **ten** degrees above 80°, you **add** four gravity points.

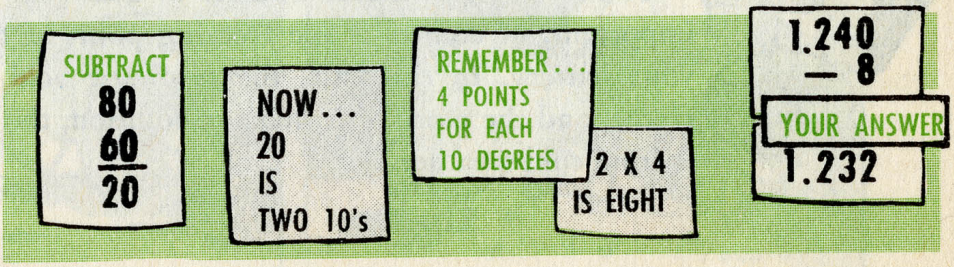
Your float is calibrated to be correct at 80° F., and in a colder solution it rides too high, so you subtract. In a warmer solution it rides too low, so you add.



APPLYING YOUR CORRECTION



Let's say your battery electrolyte is 60° F, and the float says it has a specific gravity of 1.240. Since 60° is two 10's below 80°, you're going to subtract two 4's, or eight points, which leaves you with a corrected reading of 1.232.



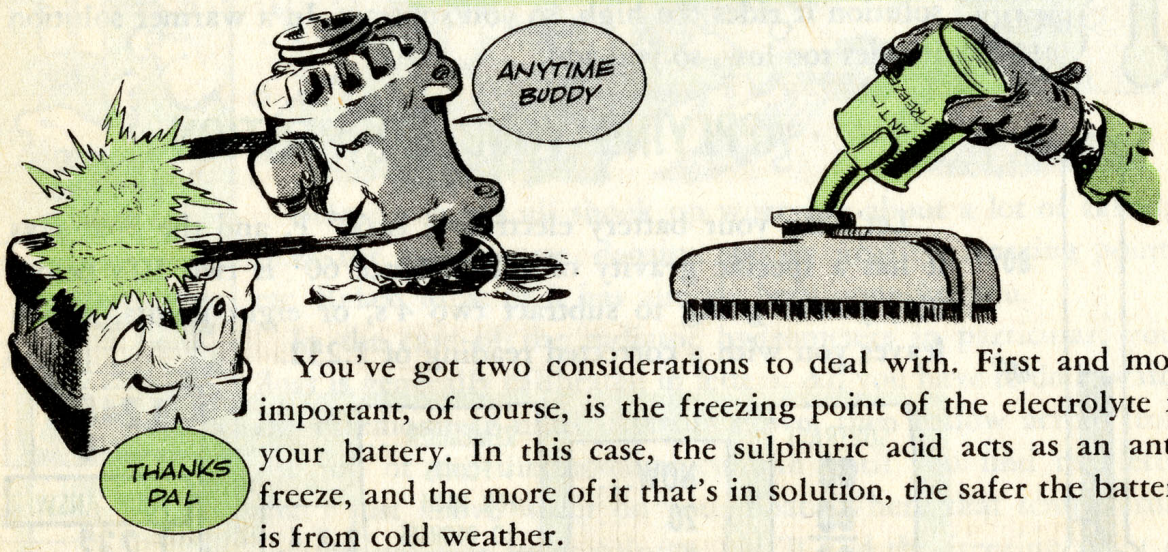
Perhaps you let the battery stand out in the truck on a cold night, and check it again the next morning. This time your electrolyte is down to 20° F, and the hydrometer says you have a specific gravity of 1.256. But when you subtract 20° from 80° you get six 10's, and six 4's (24) subtracted from 1.256 shows you you still have a corrected gravity of 1.232.

Now let's say the truck goes out on a long hard run on a sunny day, and that the use of the starter just about balances the charge from the generator. You might find when you checked your battery that the electrolyte was clear up to 100° F and that it indicated a specific gravity of only 1.224. Now, your temperature is two 10's **above** 80° F so you **add** two 4's to the float reading, and there you are again with a corrected gravity of 1.232. Easy.

There's one mistake some guys make when testing a battery in winter. They try to correct for the temperature they **expect** rather than the temperature they actually have. This won't work.

The thing you have to do is determine what shape your battery is in. You do this by taking your reading, then correcting it for the **actual temperature** of the electrolyte, at the time of the test, to determine the condition of the battery. Then, you can look at the temperatures you expect are coming and decide how that battery is likely to perform when it gets cold.

BATTERY FREEZING POINTS



You've got two considerations to deal with. First and most important, of course, is the freezing point of the electrolyte in your battery. In this case, the sulphuric acid acts as an anti-freeze, and the more of it that's in solution, the safer the battery is from cold weather.

HERE ARE THE FREEZING POINTS OF ELECTROLYTE AT VARIOUS SPECIFIC GRAVITIES, (AFTER CORRECTING TO 80°F).

BATTERY ELECTROLYTE SPECIFIC GRAVITY (As corrected to 80° F)	WILL FREEZE AT THESE TEMPERATURES
1.000 (water)	+32° F
1.130	+10° F
1.160	+ 1° F
1.220	—31° F
1.250	—62° F
1.275-1.300	—85° to —95° F

KEEP 'ER CHARGED

It's obvious that the best way to protect your battery from freezing is to keep it fully charged.

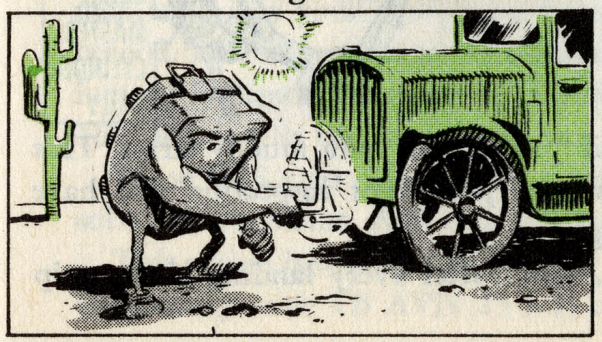
Now, once you've made sure that your battery won't freeze and bust its case, you've got to see if it'll be any use to you as far as starting your engine goes.

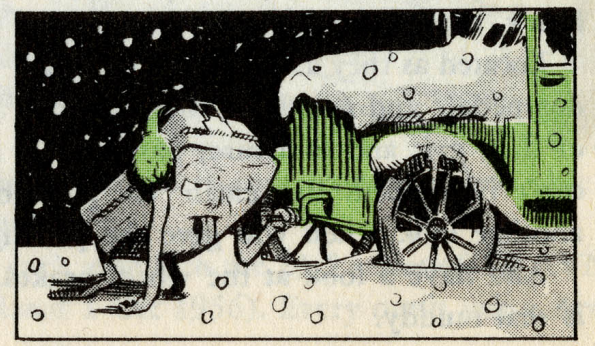
Unfortunately, even with a fully charged battery, at 0° F you only have about 40 percent of the cranking capacity you'd get from the same battery at 80° F. Battery current comes from a chemical reaction, and cold slows down this reaction—nothing you can do about it.

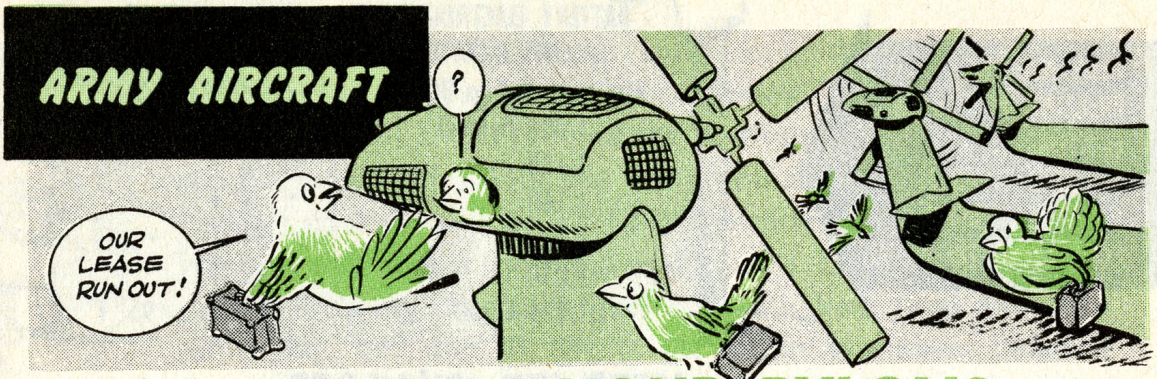
To make matters worse, your engine at 0° F requires about 2½-times as much cranking force as it does at 80° F, assuming a good engine and the proper grade oil is used. Which means, believe it or not, that on a 0° day you've only got **16 percent** of the cranking power you have on an 80° day.

So, the lesson is plain. For cold weather operation, you've got to keep your batteries as near to full charge as you possibly can. Check 'em often.

And remember, the cold that limits a battery's cranking capacity also limits its ability to receive a charge. So, if they have to be taken into a warm shop and fully charged now and then during the winter, it doesn't necessarily mean that either the battery or the charging system of the vehicle is bad. Things're just tough all over.







PIGEONS IN YOUR PYLON?

Some people have been buggin' off without slippin' on the tail rotor gear box and blade covers on their Choctaws when the aircraft are standing outside.

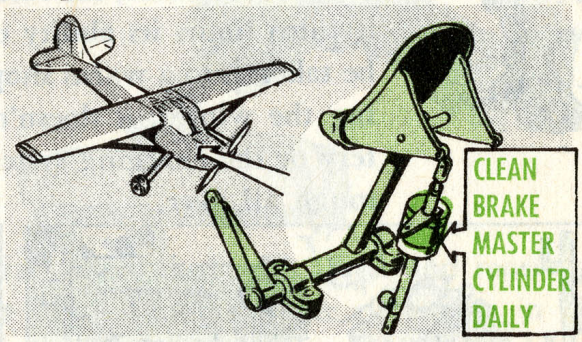
This might not be too serious for just an overnight parking, although it has happened that water has been trapped in the tail rotor blades, and this is a sort of stupid way to spend the price of new blades.

Also, believe it or not, one outfit found birds' nests, complete w/bird, eggs and other evidence, in the tail pylon of a chopper that had stood outside for a couple of weeks without the covers.

This mob was getting a litle tired of the constant reference to their "Birdy" outfit. Don't stick your neck out, use the covers.

DIRTY BRAKES

As the man said, "A clean aircraft is not always well maintained—but a well maintained aircraft is always clean." This goes double for the brakes on your Bird Dog.



Carelessness about cleaning the brake master cylinders has made 'em stick from dirt and corrosion. Then they don't release fully, and the next thing you know, they're leaking.

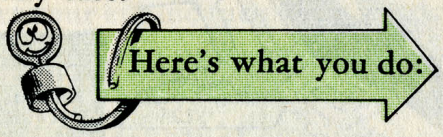
Located as they are between the rudder pedals and the floor, they get lots of dirt, grit and moisture, particularly if you're flyin' offa muddy strips. This can't be helped. But clean 'em good on the post-flight inspection and have another look when you give the pre-flight.

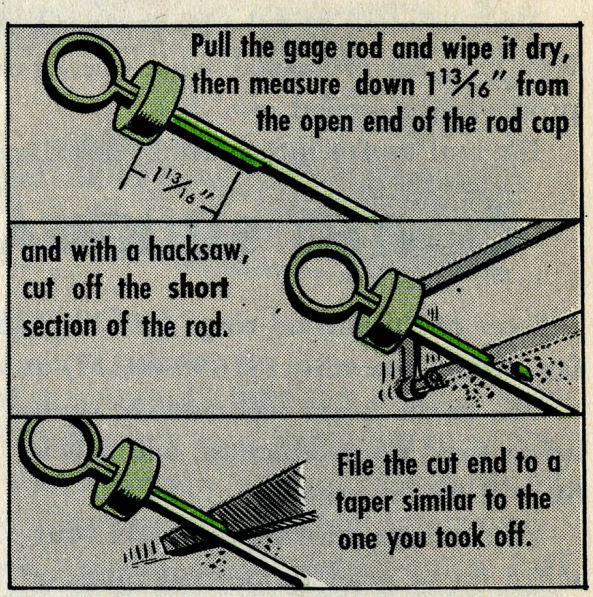
And have a look at the wheel brakes, too... after every landing if the strip is real muddy.

GOOFY GAGE RODS

The oil gage rods (dipsticks) in the O-470-11 and O-470-15 engines in some of your Bird Dogs (L-19A's, L-19E's and TL-19D's) didn't do so good. Seems like they said "Full" when there were still 2 quarts to go.

So, TM 1-1L-19-1001 (14 March 57) and Supplement TM 1-1L-19-1001A (6 June 57) tell you to change 'em at the next inspection or within 60 days in any case.

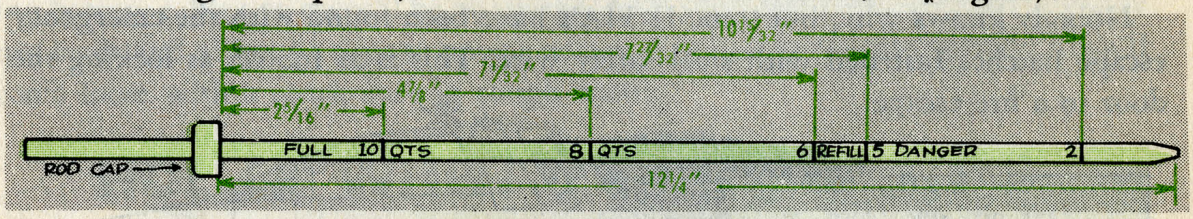




Next, you use a small grinder or a file to remove the existing marks from the gage rod. Now, measure down again, always from the open end of the rod cap, and using a rule calibrated in 32nds of an inch. Using a small tricornered file, an electric etching pencil or ⅛-in lettering stamps, you scribe and letter new marks like in this sketch.

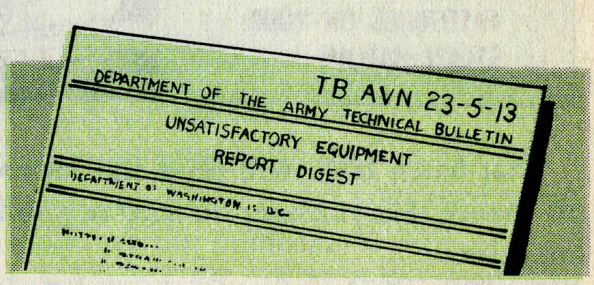
That's all there is to it. You replace the gage rod and add oil to bring it up to the full mark.

After fixing the dipstick, enter the fact on DD Form 829-1 (engine).



UER DIGEST

Most of you know that there's a way you can tell your troubles to the top men, as far as your equipment is concerned. That is, you can send in Unsatisfactory Equipment Reports (DA Form 468) like it tells you in AR 700-38.



These UER's go right to the engineers, designers and technicians best able to solve the problems. And they get fast action.

This action is reported to the field each month in the 23-5 series of TB AVN's (beginning with TB AVN 23-5-1, dated 1 Oct 1956). Every outfit using Army

aircraft is on the distribution list for these TB's. Be sure your outfit is getting theirs, and check it when it comes out.

You may find just the fix you need. And the TB will also tell you what problems have been reported, what's being done, and if any more reports on the same problem are needed.

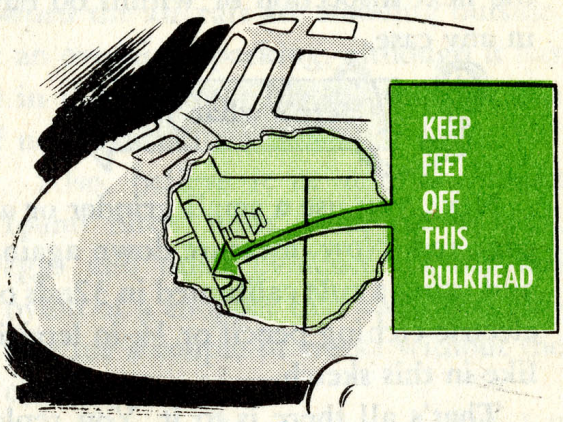
It's real useful information; don't miss it.

CANTED BULKHEAD CAN'T TAKE IT

Some of the shroud rings (S1620-61283-10) have been chafing on the engine fan shroud assembly (S1630-80317) at station 75.5 on the H-34A choppers.

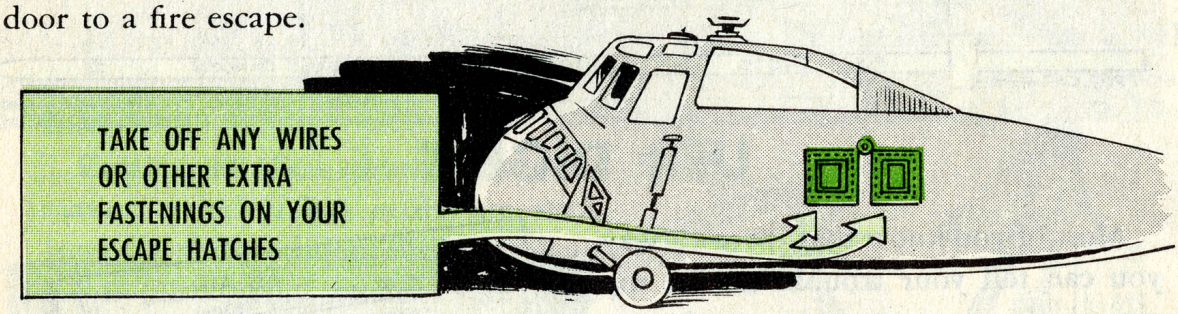
OK, so the lower web and the canted bulkhead are a little weak. This is now being fixed on production, and a field fix will fix the others.

You maintenance men can save yourself a lot of grief by not stomping on that bulkhead, and not leanin' on it when you're cleaning and servicing the clutch compartment. This'll make it harder to work in there, but that's easier than replacin' worn parts. Keep your feet off.



IF YOU GOTTA GO...!

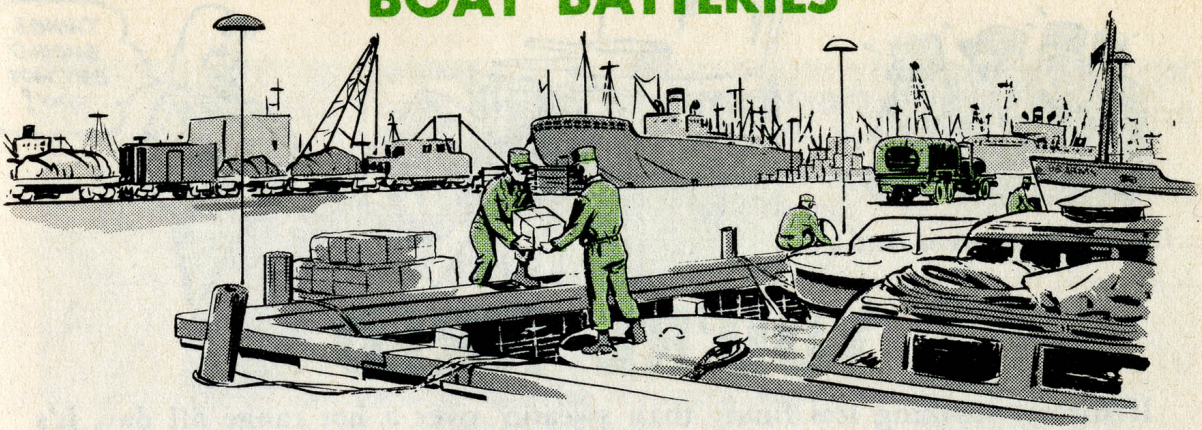
Nobody knows why, but some H-34A's have been found with the emergency escape hatches fastened with steel safety wire. This is as foolish as locking the door to a fire escape.



That hatch latch will hold and lock without any other fastening. And in the off chance that you ever do need it, you'll want to work at bailing **out**, not bailing wire.

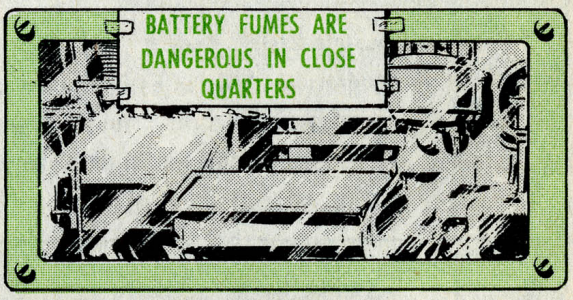
So, if you find any wires or any other extra fastenings on your escape hatches, take 'em off. First of all, you won't lose the hatch, and second, even if you did, believe it, it's easier to explain to the maintenance officer why it was too loose than to tell St. Peter why it was too tight.

BOAT BATTERIES



Batteries on your boats are just as vital to you as the batteries in a shoreside vehicle, only more so. On accounta sometimes it's lots more important to be able to get your engine turning at sea than it ever is on shore. A parted anchor line off a lee shore can make you real grateful if your engines crank up right **now.**

So everything PS has said about battery care goes double for boatmen. And there are a couple of additional points you want to remember. First of all, your battery compartment probably isn't as well ventilated as the hood of a truck, so you've gotta be more careful about fumes. Hydrogen is explosive, and forgetting this can cost you your boat.



Be particularly sure that **all** the electrical circuits are turned off before removing battery cables, so there'll be no sparks. And don't, for gosh sakes, let anybody use leads and alligator clips to power personal radios from your battery. They'll come loose with a spark sure in rough water.

HOLLER WHEN YOU'RE HURTIN'

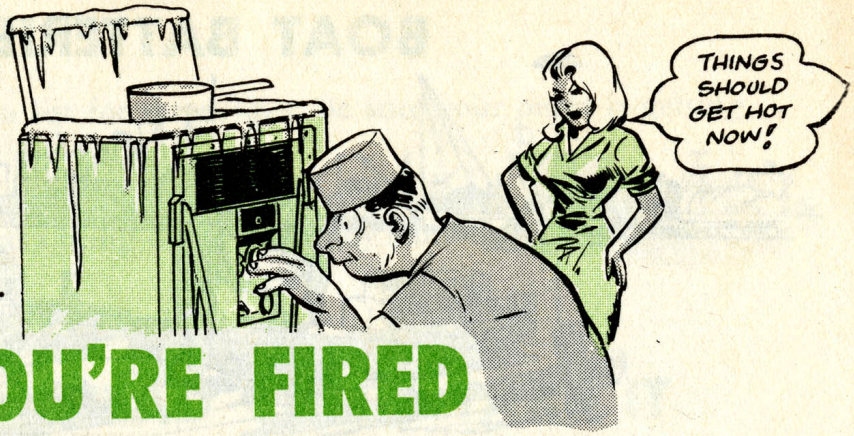
Look once, all of you TC men on the ground or the water, you're letting the fly-boys and rotorheads run away with the show on UER's.

Sure, we know the whirlybirdmen have lotsa problems, but to look at the UER's that come in, you'd think they had **all** the problems. We know better!

AR 700-38, as changed, puts out the poop on submitting an Unsatisfactory Equipment Report, and that's the best way in the world to get your equipment shaped up. (Too bad you boatmen can only use the nonprofane 10% of your vocabulary fillin' 'em out. But you'll find that one UER can do more good than a month's hard cussin', at that.)

So, when you're hurtin', scream! Tell the man what's wrong with your craft, truck, or locomotive.

Try This Maneuver And . . .



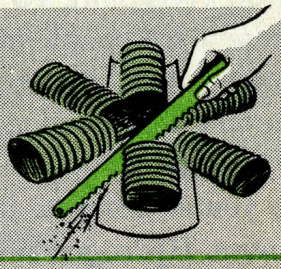
YOU'RE FIRED

If there's anything less funny than sweatin' over a hot range all day, it's sweatin' over a cold one. Lack of fire power can be mighty embarrassing, if not downright disastrous.

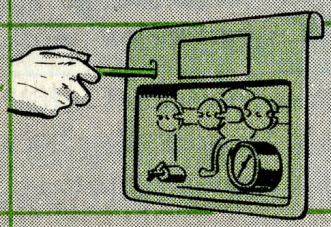
To keep those M-1937 field range fire units on the firing line, keep in mind these ingredients for a

BEFORE OPERATION CHECK

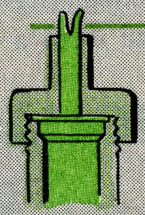
1. ✓ BURNER HEAD—Keep it clean. The narrow slots on the six burner-arms have to be kept open and free of dirt. The tool kit packs a thin strip of tin for this purpose, but a hack saw blade ground down to fit does the job with even less sweat.



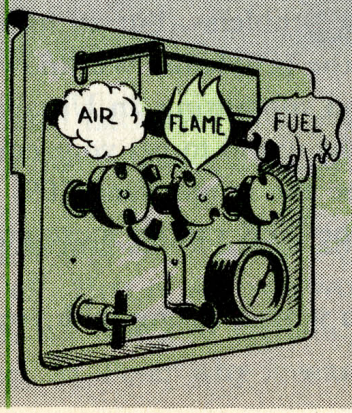
2. ✓ BURNER CONTROL ROD—It has a knack of getting lost, so make sure one is there. If not, rig up a substitute till you can get another.



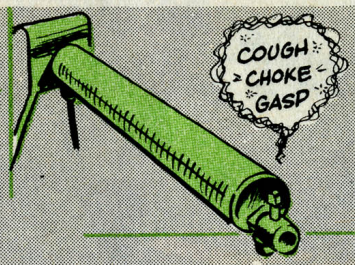
3. ✓ FILLER TUBE CAP (fuel tank)—The ground surfaces of the cap and plug—and top of the filler tube—have to be clean so's to give an airtight fit. And when you tighten the cap, make it snug and not too tight.



4. ✓ VALVES: AIR-FLAME & FUEL—Be sure they don't leak. Tighten the pack nut and, if necessary, replace the graphite packing. Joints with threads hafta be tight—and checked to be sure their threads aren't crossed or stripped. 'Course, you'll keep the valves cleaner'n a hound's tooth. For this chore, solvent is better than gasoline. Safer, too. Might also keep an eyeball trained for the old, old trouble: The wrong knob on the wrong stem, or the wrong stem in the wrong slot. So who's on first: Here's the rundown: from left to right as you face the burner it's AIR . . . FLAME . . . FUEL. (PS 48 gives you the dope on the stem differences.)



5.

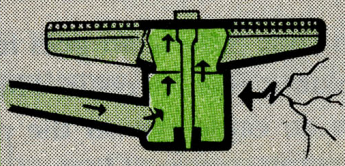


GENERATOR—Clean the hot vapor tube weekly, or after 10 tankfuls. If the generator's clogged so bad that gasoline can't get through, yell for another one. A generator should be good for up to 500 hours.

6.

INPUT VALVE—Dirt in the passages of the valve body and the valve check-seat means lots of pumping and little air. Clean out the gook to keep in business.

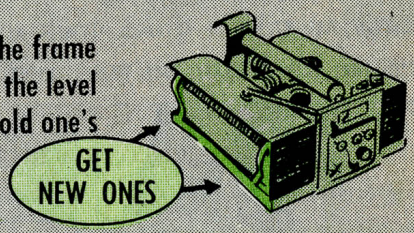
7.



MIXING CHAMBER—Be on the lookout for cracks, which are the beginning of the end for the chamber.

8.

FIRE UNIT FRAME—The angle iron and brackets of the frame can get bent or twisted. Since the unit has to be on the level to deliver the hot goods, order a new frame if the old one's getting to look too much like a pretzel.

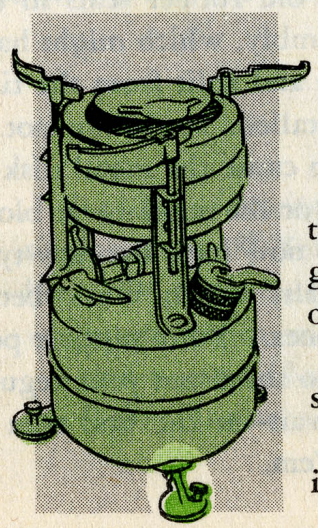


Now, that fire unit is one thing that works best under pressure. It's gotta have it.

If the pressure drops in the gage as fast as air goes in, some soapy water around the joints will help you snoop for leaks.

Graphite grease puts the stopper on that. Just smear a fingertip-full on the joint and tighten it up. A 1-lb can of medium grade Grease, Graphite FSN 9150-190-0918 (QM) should be plenty for many a moon.

And be sure you keep your copy of TM 10-701 handy.



TOE HOLE

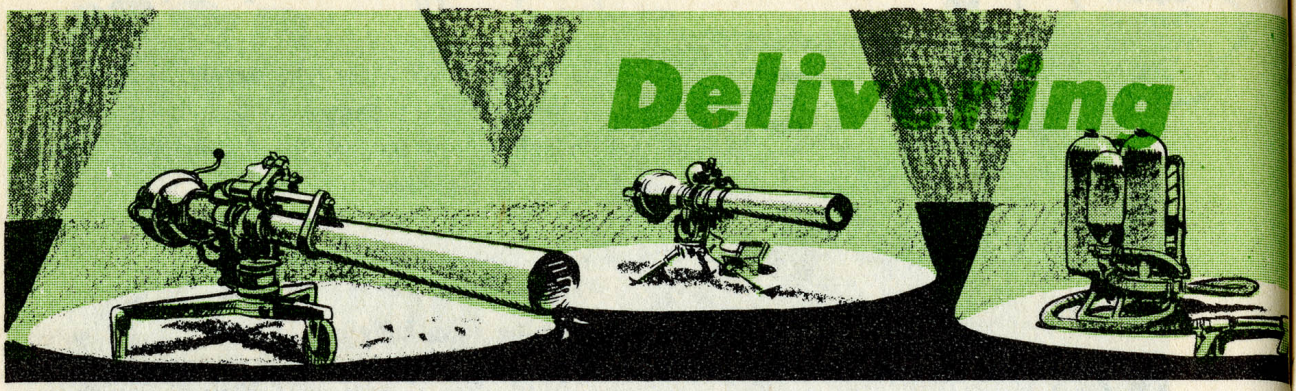
Ever notice the M-1950 stove's got holes in its feet?

All three of 'em.

Not good for humans, 'course, but it makes sense on those little cookers. A little bump or push, and over they go. An evening's hot chow slops on the sand, or jungle, or wherever.

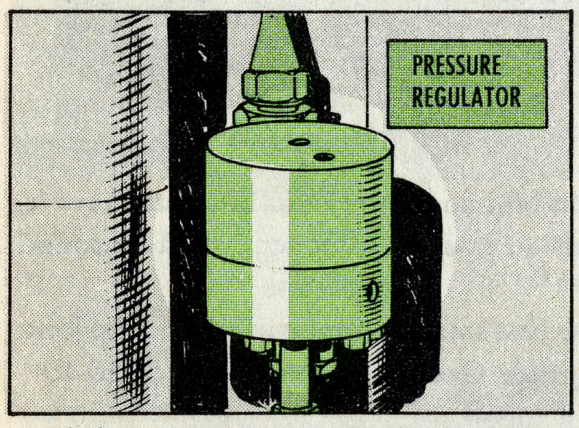
A nail or two driven through the holes, though, will secure the stove and deadline its rock'n-roll.

Comes time to form up and move out—slip the nails into the carrying case 'til next time.

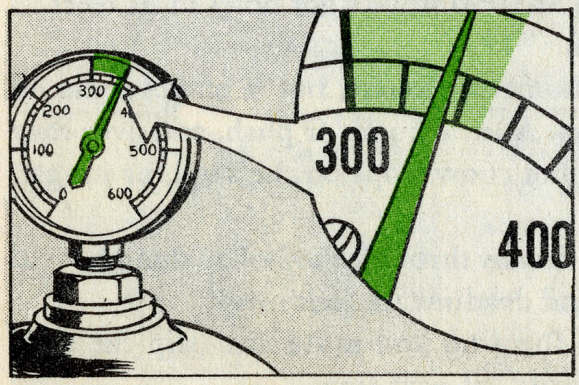


DON'T LOSE YOUR HEAD

If the fuel stream from your M2A1 Portable Flame Thrower starts dribbling toward your target like a basketball with the hiccups or begins to poop like a droopy rocket, best you have a technician take a quick look-see at the pressure regulator on your weapon.



If the pressure's too high or too low in that pressure regulator, you might as well pack up and go home, 'cause your weapon won't fire like it should.

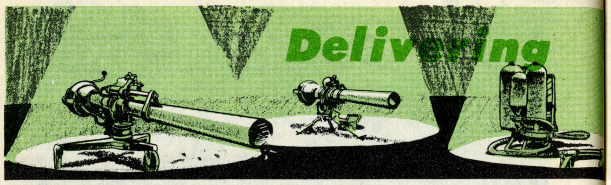


When your technician goes to adjust the regulator, like it says in TM 3-376, he keeps an eagle eye on the pressure gage to see that it stays between 300 to 350 PSI, and then gives it another check 10 or 15 minutes after adjustment.

The disk in the safety head is set to burst when the pressure reaches 525 PSI. But don't wait 'til it blows before something is done about it. At the first sign of faulty pressure, if readjustment doesn't do the trick, and your technician has checked out the other trouble-shooting tips in the TM, he should call in your Chemical support outfit—they'll play doctor to the regulator's innards so's you won't have any more trouble.

Sometimes the trouble, y'see, is caused by the old rubber seals in the seat-valve assembly, which might have become brittle and split from the time they were installed. If they're not in place, they can cause the metal disk in the safety head on the regulator to blow.

(Most units now have the new type nylon seat seals, which work better than the old ones.) Your support people'll be able to check out your regulator so don't wait—at the first sign of trouble, buzz 'em.



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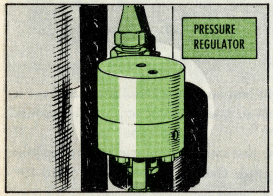

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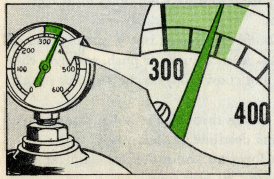

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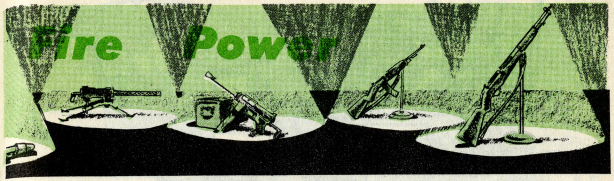
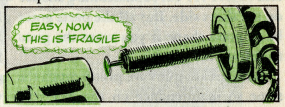


CLICK, CLICK—CRUNCH

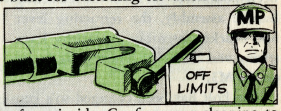
Have you been cryin' in your three-point-two because you clicked your way into a statement of charges with the M2 tripod mount for the .30-cal machine gun?



Maybe you've been eggin' on the elevation for one or two clicks too much. Ease up a bit. The upper elevating screw stop assembly is kinda fragile. So when elevating your weapon near the top limits, call a halt when you feel the assembly tighten up.

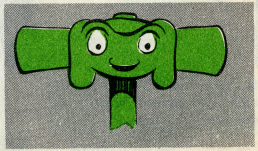
You also wanna be careful with the same part on the M3 tripod mount for the .50-cal machine gun. The M3 elevating screw stop assembly is a little more rugged than its M2 cousin, but it's not built for exceeding elevation limits.

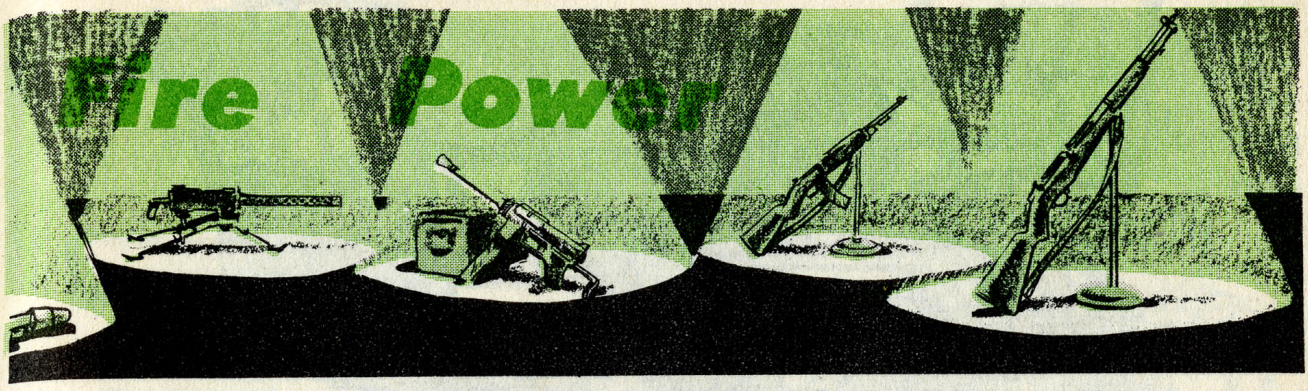
Another thing...make the inside of the traversing slide lock assembly "off limits" when you're cleaning the mounts. Sure, you need only a screwdriver to take the assembly apart. It's even easier to lose the washer and spring from inside. Confine your cleaning to use of a brush and some solvent.



WHATZIT?

Your kid's favorite toy? TV's favorite singing puppet? Your neighbor's firstborn? Of course not. It's a very worthwhile preventive maintenance pointer . . . and a good rifleman will have it on the first try. (Answer is on Page 59)





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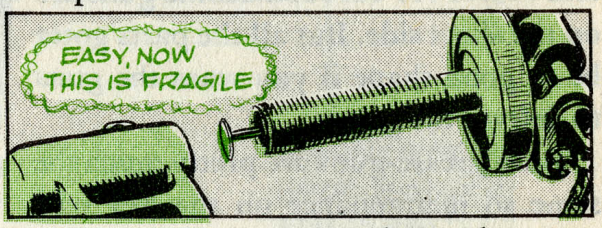

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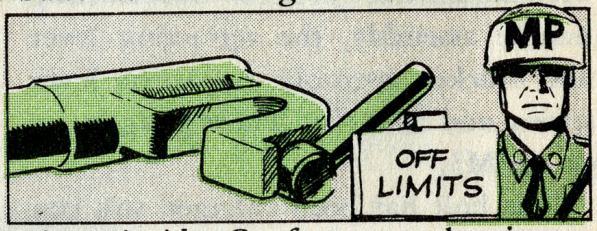

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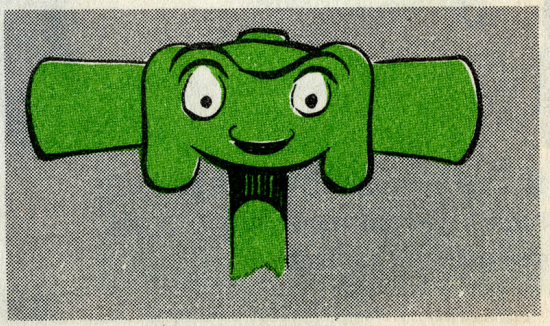
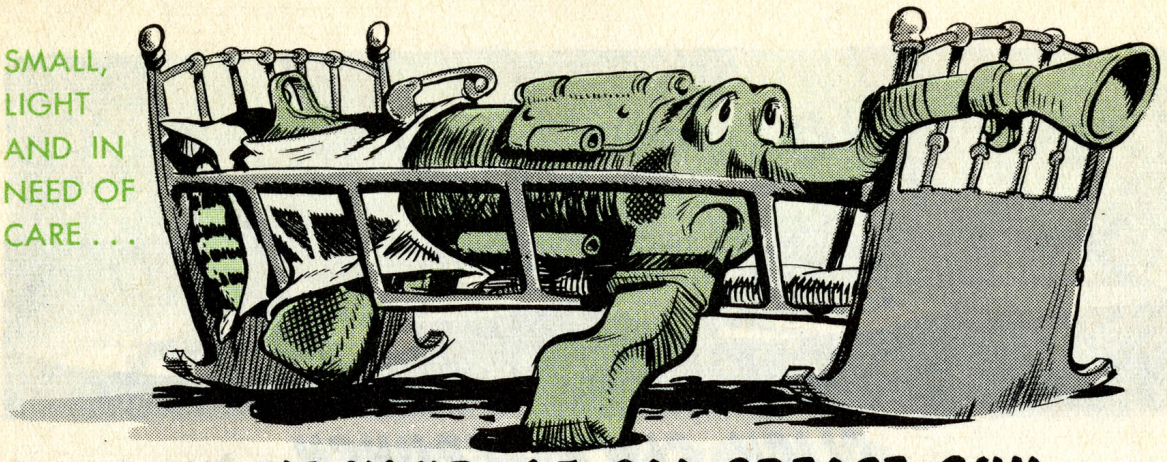


SMALL, LIGHT AND IN NEED OF CARE . . .



THAT'S YOUR .45-CAL GREASE-GUN

When it comes to parts . . . the M3 and M3A1 .45-cal submachine guns are on the short side. But all the parts gotta be in good shape if you want the guns to deliver the goods.

Both grease-guns are pretty much the same so maintenance on the M3 will work about the same with the M3A1.

This is the way the big differences stack up.

The M3A1 housing assembly has been modified to get rid of the retracting handle assembly, the retracting lever and bracket assembly, retracting lever spring and oiler clip. Those gadgets are on the M3.

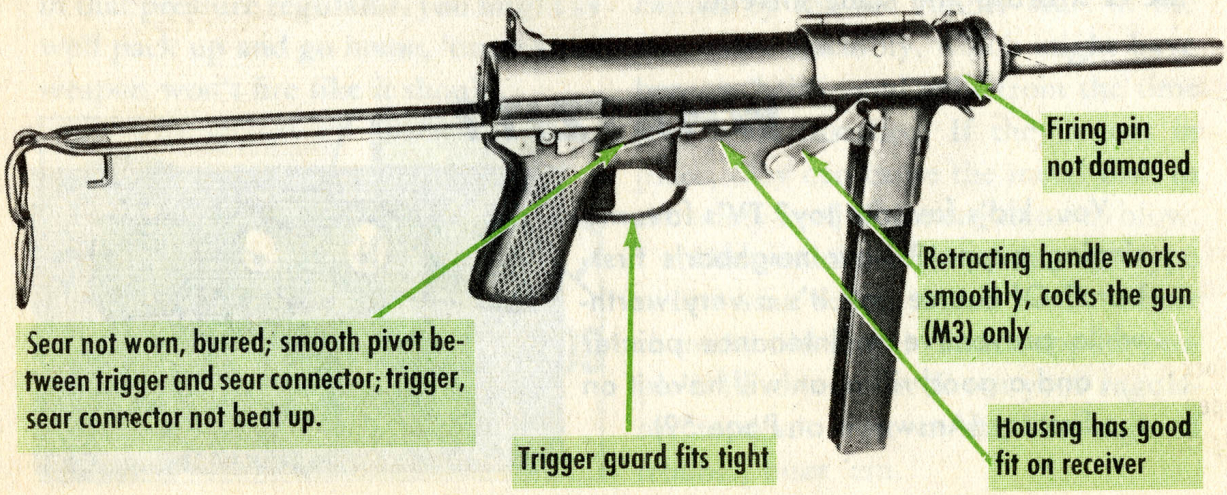
The bolt has been changed so's you can retract it with your finger to cock the weapon.

The stock has a bracket welded at the hind-end. The bracket is used as a hand loader for getting ammo into the magazine and as a stop to keep the stock from going too far into the barrel when you work it like a cleaning rod.

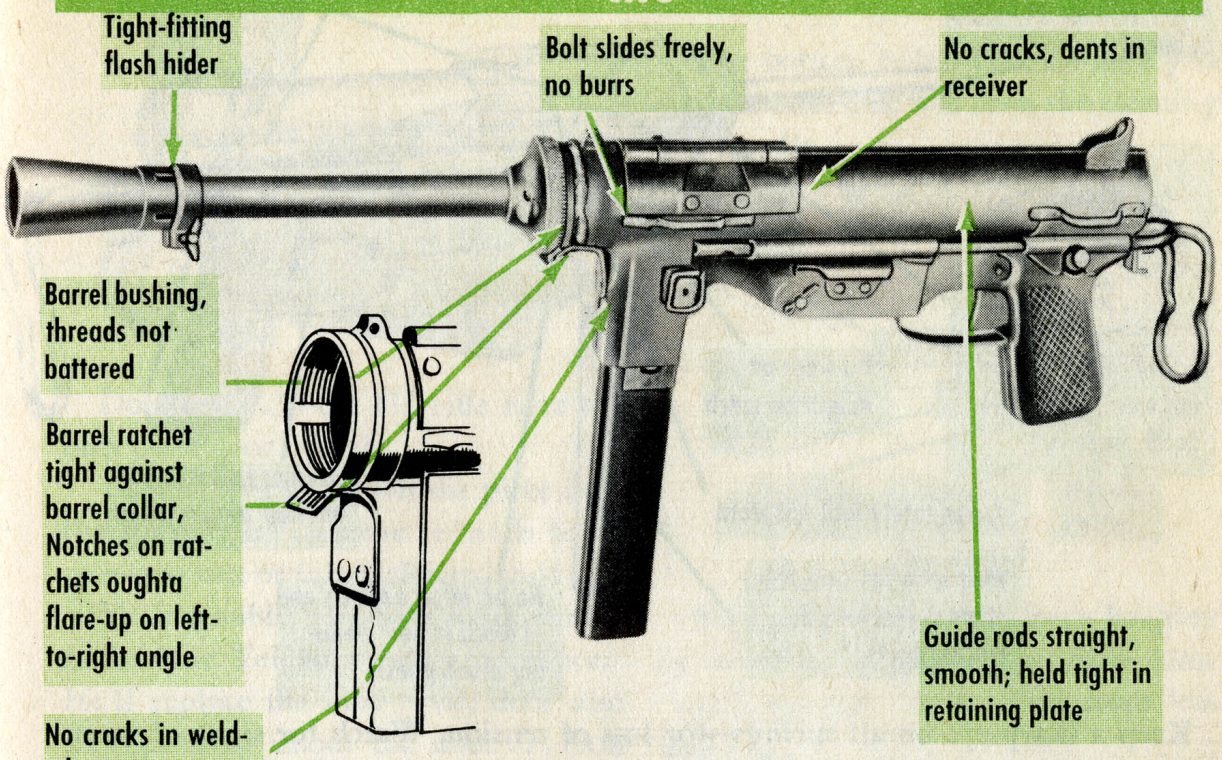
The receiver assembly got itself an oil reservoir and oiler in the pistol grip.

And the barrel assembly has two flat cuts on the barrel collar so you can use the stock as a wrench in removing the barrel from the receiver.

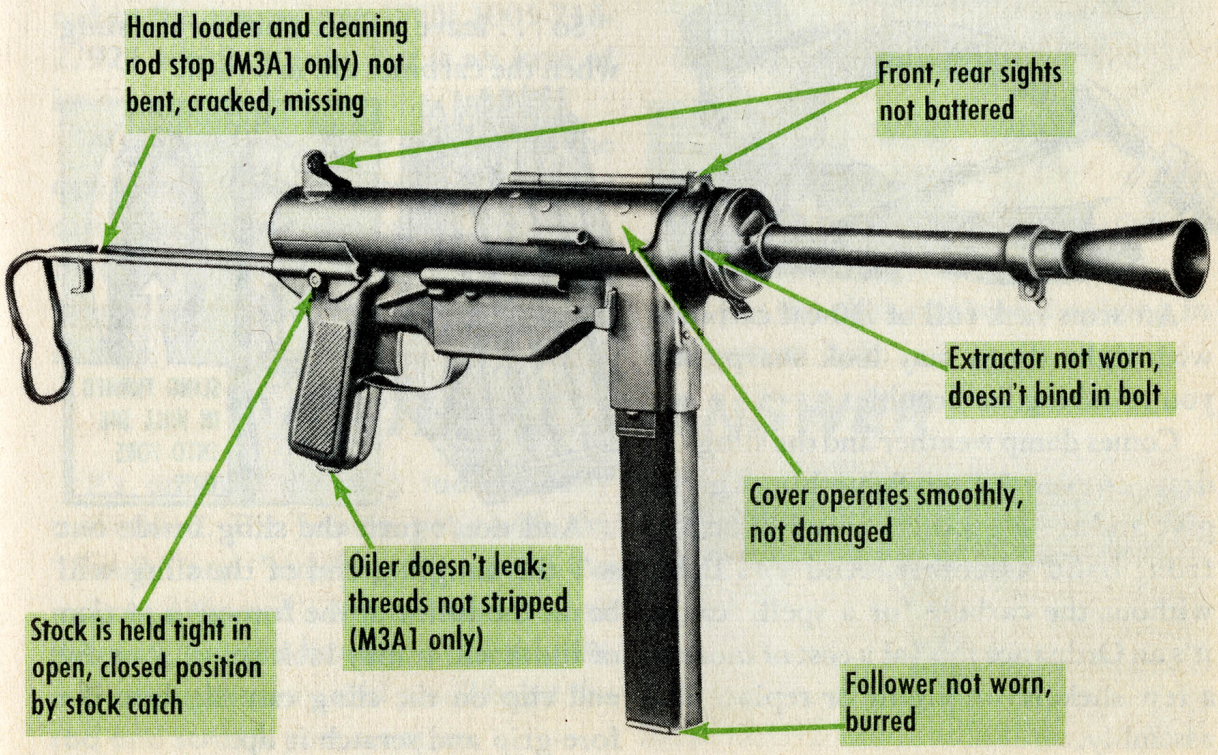
Now that you know the differences . . . here's what you wanna keep checking for. The checks are the same for both guns except where the difference is pointed out.

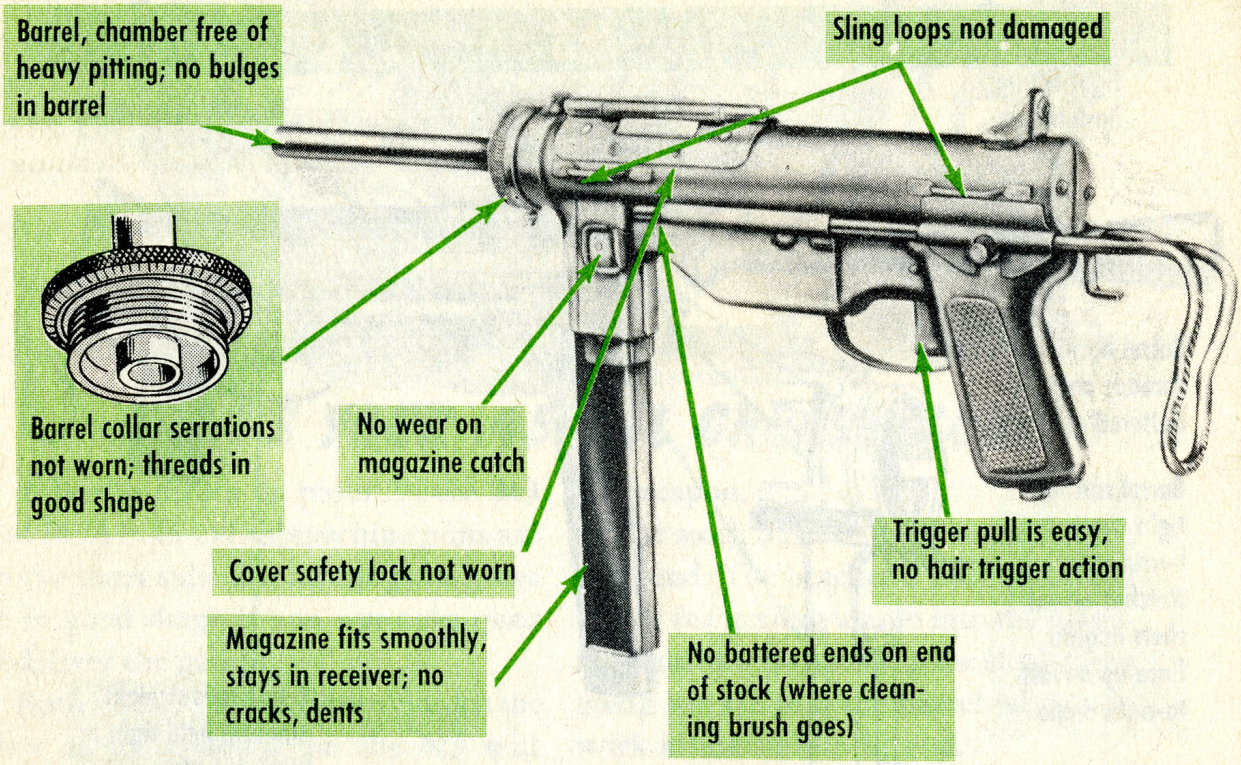


M3


Tight-fitting flash hider
Bolt slides freely, no burrs
No cracks, dents in receiver
Barrel bushing, threads not battered
Barrel ratchet tight against barrel collar, Notches on ratchets oughta flare-up on left-to-right angle
No cracks in welded seams
Guide rods straight, smooth; held tight in retaining plate

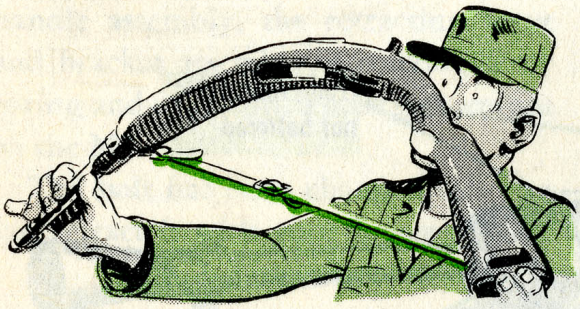
M3A1


Hand loader and cleaning rod stop (M3A1 only) not bent, cracked, missing
Front, rear sights not battered
Extractor not worn, doesn't bind in bolt
Cover operates smoothly, not damaged
Oiler doesn't leak; threads not stripped (M3A1 only)
Stock is held tight in open, closed position by stock catch
Follower not worn, burred



Keep a sharp eye on all springs—for loss of tension. Watch for signs of wear and tear on the sling and don't forget other troublemakers—rust, dirt, carbon, corrosion and lack of lubrication.

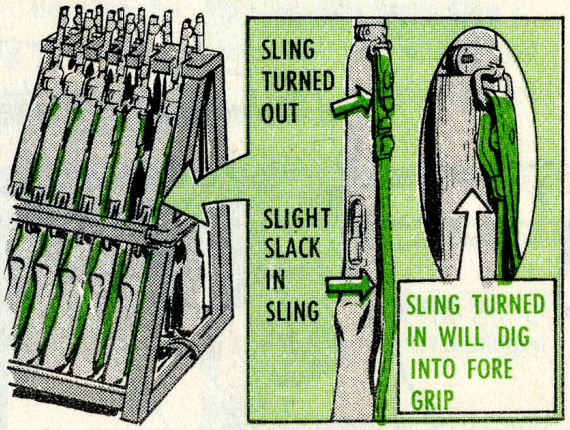
TWO-WAY STRETCH—TOWARD THE MIDDLE



An arms rack full of .30-cal carbines with tight slings may look sharp, but you're asking for trouble.

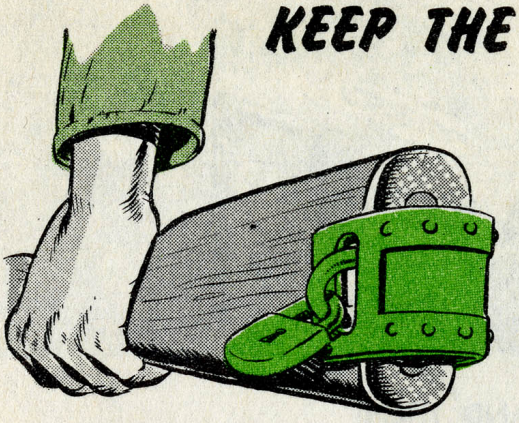
Comes damp weather and the slings'll draw up even tighter. Something's gotta give and it's a good bet that it'll be the front band assembly. And you'll be without the carbine for a spell, 'cause it's an Ordnance job (at a cost of more'n a few shekels) to repair or replace the assembly.

So . . . leave a little slack in the sling when the carbines are in a rack.



And don't turn the sling inside out so's the dangling end of the sling will be on the inside at the fore-grip section of the stock. It may look neater, but the end clip on the sling can dig into the fore-grip and scratch it up.

KEEP THE DOOR SHUT



Does your .30-cal M1 rifle have the butt plate door blues?

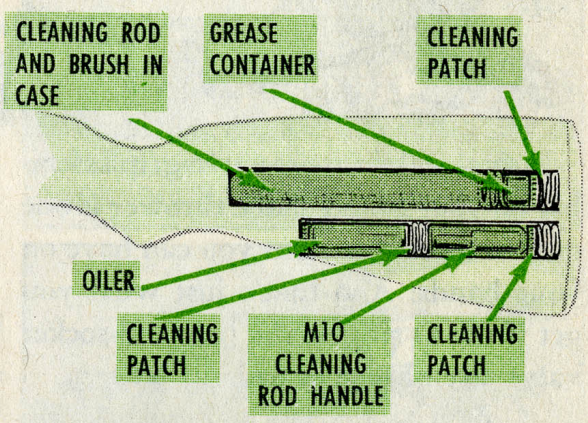
That is, when you jolt the piece does the door open so's the innards hang part-way out or fall to the ground?

Your trouble may be a weak spring in the door. Tell your company artificer. He'll replace the butt plate, door and all. Speaking about the door . . . have you been storing the stuff that goes behind the door the right way?

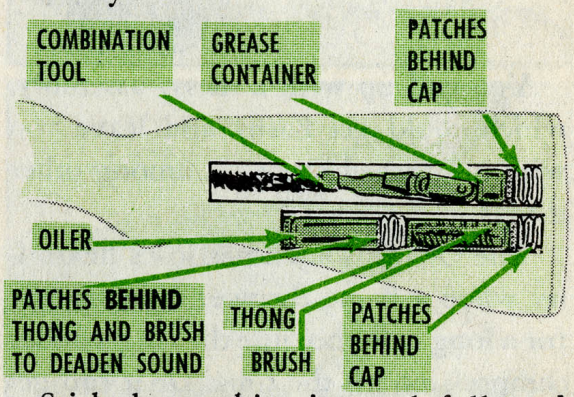
The M-10 cleaning rod goes in the upper storage hole. First, you put the rod in the canvas case (FSN 1005-716-2792) which is new, but is an item of issue.

Make sure you have the tab on the case facing the butt plate door. It's a lot easier to remove the case if you have that tab to grab hold of. The grease container goes between the cleaning rod and the butt plate door.

The bottom hole? That's where you put the oiler case and then the cleaning rod handle.

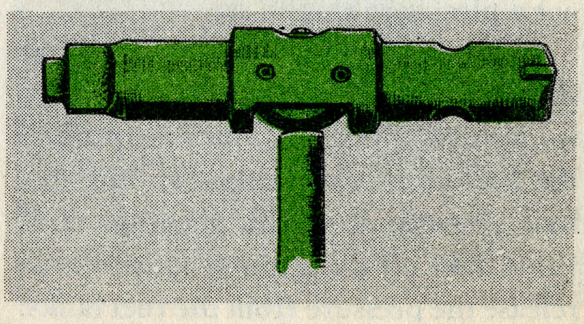


Supposin' you haven't been keeping up with the times and you have some "old-fashioned" tools. You store 'em this way:

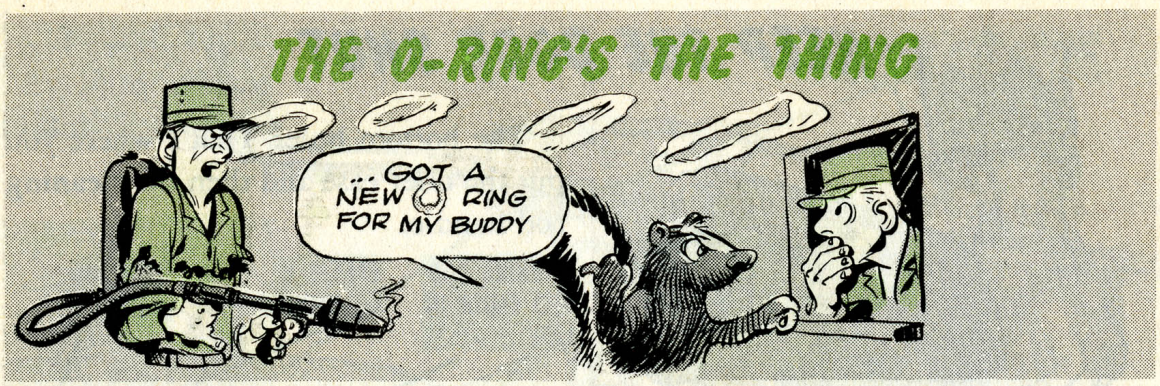


Stick the combination tool, followed by the grease container, in the top hole. And put the oiler case and the thong in the bottom hole.

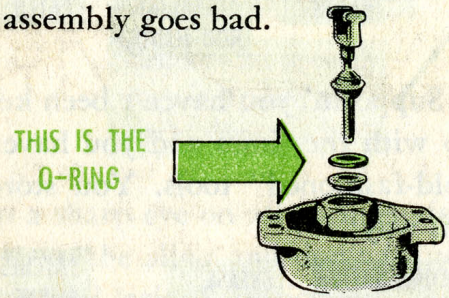
WHATZIT ANSWER



It's an M10 cleaning rod properly assembled. The handle goes with the "mouth" and "ears" section next to the rod. And the rod's to be screwed in all the way thru the handle. Assemble the rod any other way and you'll bend the rod and scratch your weapon.



A fuel leak into the valve-grip assembly on your M2A1 flame thrower is one of the worst situations you can have on your hands. And that's just what you get if the O-ring in the ball-and-socket valve assembly goes bad.

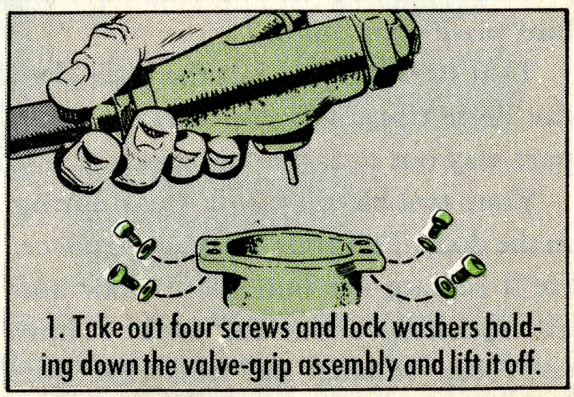


You end up with a messy assembly, which could get flashy and leave you with a scorched torch . . . among other things.

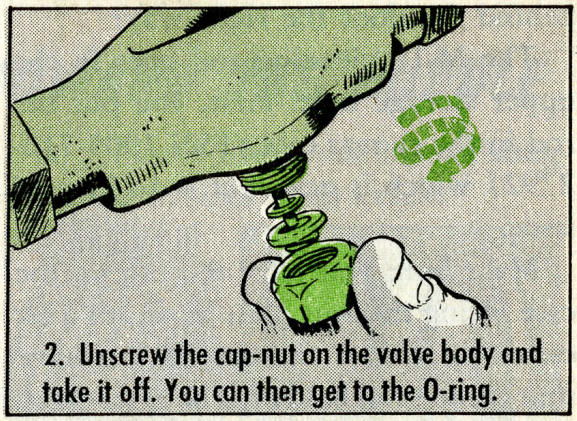
The O-ring sometimes loses flexibility when a flame thrower is in storage for a long time, because the ring's under compression all the time. Or it can get damaged some other way. Sometimes the ball on the ball-and-socket valve assembly is too small and won't fit right. This causes the O-ring to ride too high on the ball. And a high-riding O-ring is not a pleasant thing to see.

So, at the first sign of a fuel leak at the trigger assembly after your fire spitter's been charged, sneak a peek at the ball-and-socket assembly. But before you do, close the pressure tank valve, take off the ignition cylinder and release the pressure from the fuel tanks.

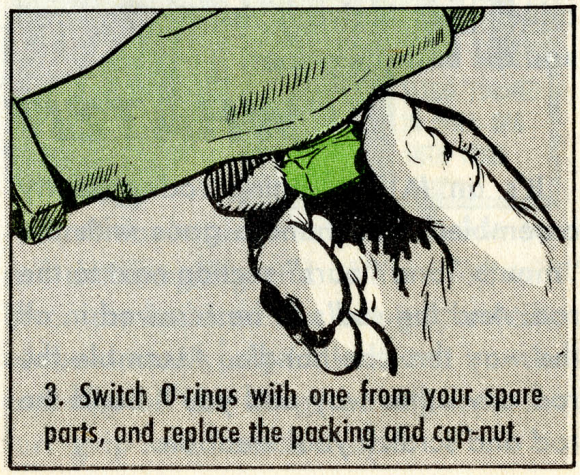
AND THEN:



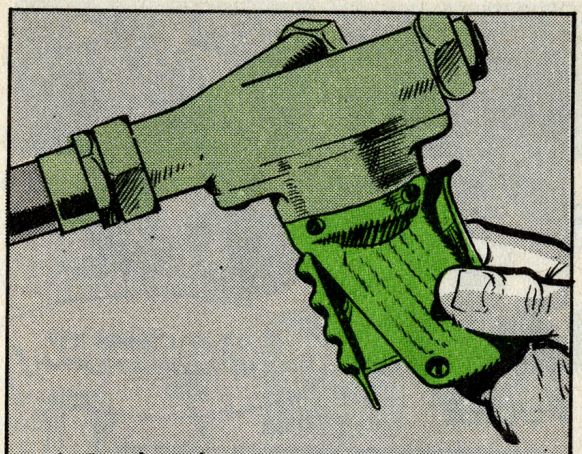
1. Take out four screws and lock washers holding down the valve-grip assembly and lift it off.



2. Unscrew the cap-nut on the valve body and take it off. You can then get to the O-ring.

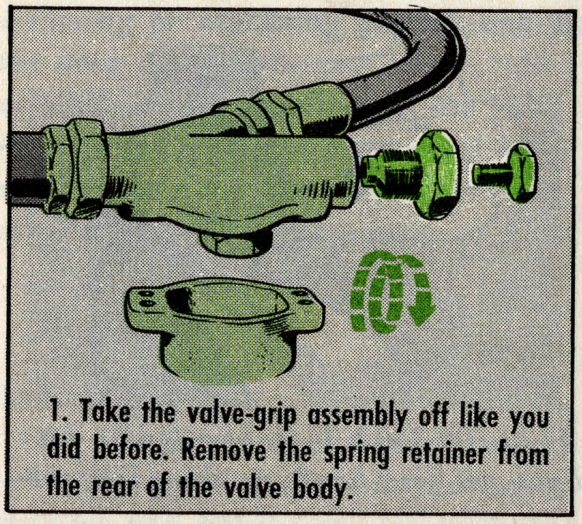


3. Switch O-rings with one from your spare parts, and replace the packing and cap-nut.

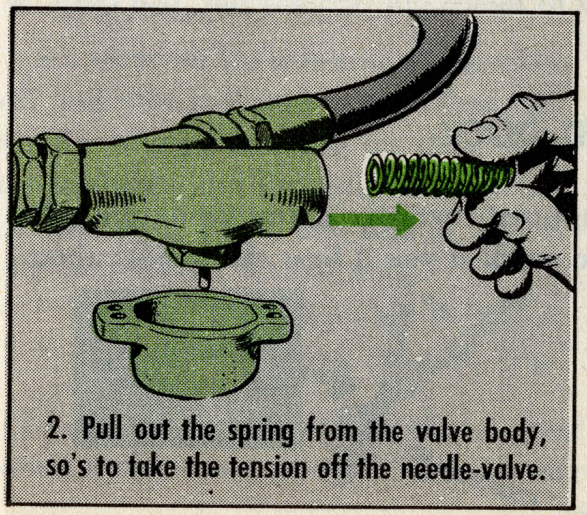


4. Put the valve-grip assembly back on.

The chances are the new O-ring will take care of your leak. If it doesn't, you'll have to replace the whole ball and socket. Here's how:

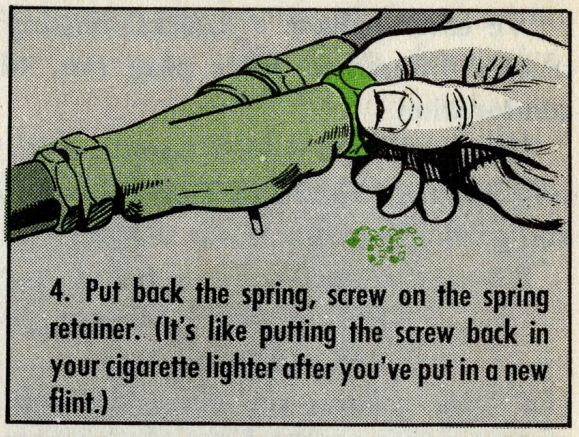


1. Take the valve-grip assembly off like you did before. Remove the spring retainer from the rear of the valve body.

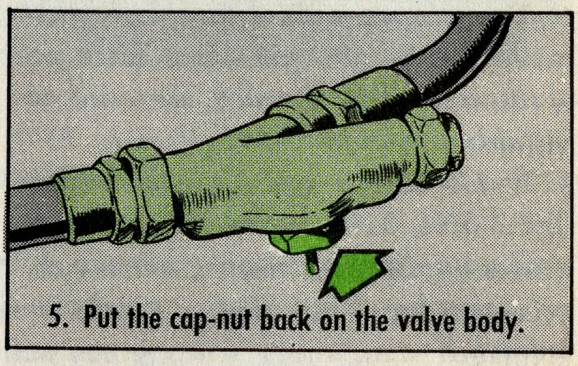


2. Pull out the spring from the valve body, so's to take the tension off the needle-valve.

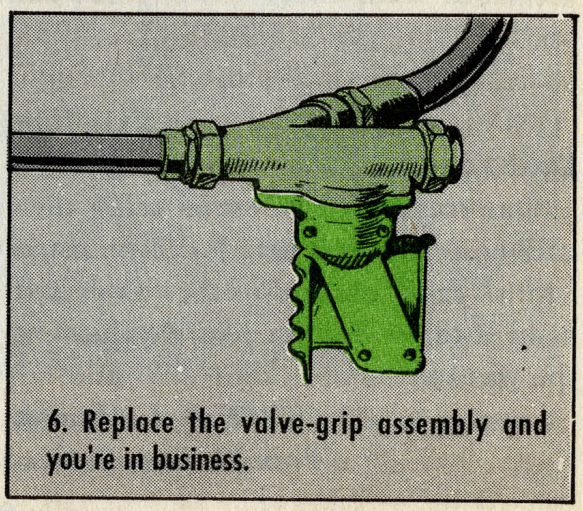
3. Replace the ball-and-socket assembly (FSN 1040-293-5893) with a new one.



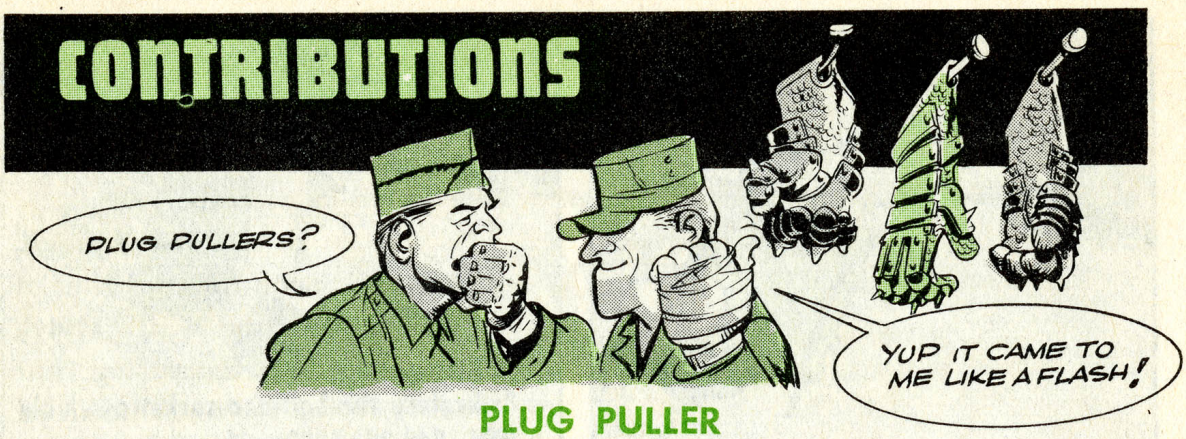
4. Put back the spring, screw on the spring retainer. (It's like putting the screw back in your cigarette lighter after you've put in a new flint.)



5. Put the cap-nut back on the valve body.



6. Replace the valve-grip assembly and you're in business.



PLUG PULLER

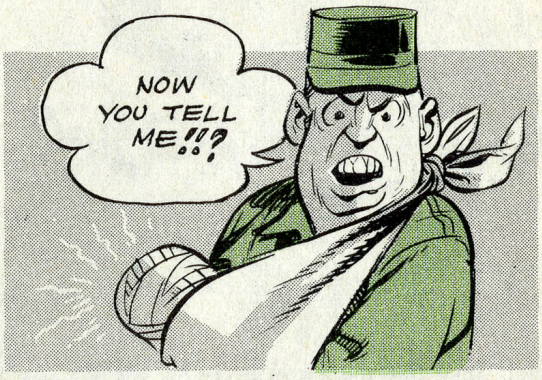
Dear Editor,

We used to have a knuckle-busting time getting that G749-series 2½-ton truck's differential filler plug out, till this outfit came up with the right combination.

This combo is a wrench handle, FSN 5120-221-7958 mated with a 5-in extension bar, FSN 5120-243-7326. The bar just fits into that plug with no trouble — and getting it in and out is simple.

It's sure stopped a lot of fussin', fumin' and skinned knuckles.

PFC Walter R. Drake, Jr.
APO 28, New York

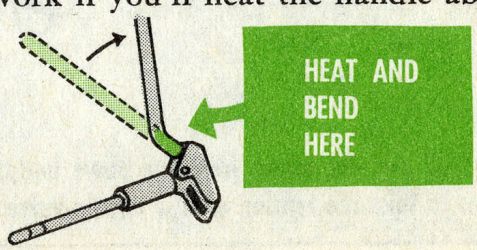


(Ed Note — Guess you haven't gotten that new open-end adjustable wrench just made for this job. The full name of this wrench is: Wrench, open end adjustable: 1⅛-in jaw opng, 10-in lg, FSN 5120-449-8083 — and it's listed in your Ord 7 SNL G749, April '57. It's to be used with differential plug wrench, FSN 5120-708-3302. It looks just like your extension bar. Your idea's a good one till you get your hands on this adjustable wrench.)

RUPTURED DUCK

Dear Editor,

Our recoilless rifle crews using the ruptured cartridge extractor on the sub-caliber device find that it can be made to work if you'll heat the handle about ½ inch from the end of the shank and bend it to 30 degrees like we show in the picture.



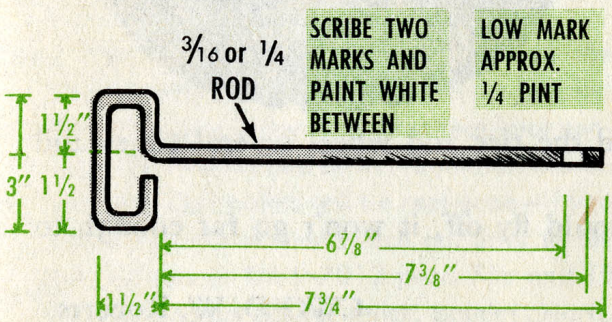
OCMT B. L. Hyman
Fort Jackson, S. C.

HANDY DIPPER

Dear Editor,

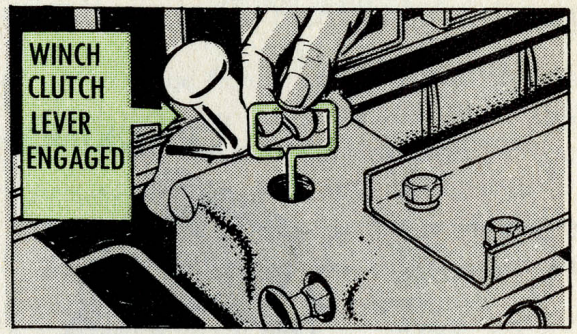
As you know, there is no lube level plug on the winches (winch end bearing housing side) for the G749- or the G742-series, 2½-ton trucks. So, since this is a necessary inspection point, I made a handy dipstick to help do the job.

All you do is get a piece of scrap metal and mold it into shape like so.



When you go to use the dipstick, be sure to center it on the top front of the filler hole with the winch clutch lever engaged. You're measuring your lube level from the top and outside of the filler hole down to the marks scribed on the bottom of the dipstick.

Sgt. E. M. Fernandez
APO 25
San Francisco, Calif.



(Ed Note — Looks like your dipstick'll do the trick. Not only will it help keep tinkering or exploring fingers out of the drag brake adjusting screw, 'specially with green drivers in the fold, but will save on the amount of lube used — only one pint needed to keep those winches in good shape.)

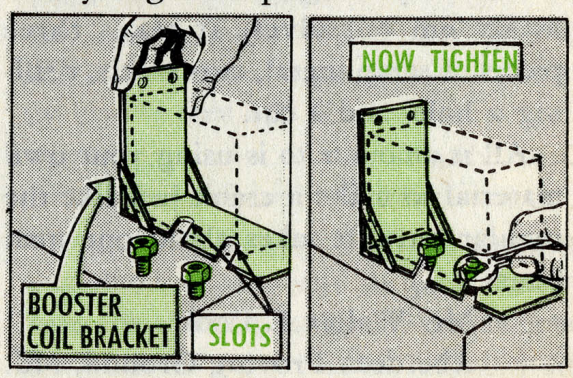
GIVIN' IT A BOOST

Dear Editor,

We found replacing a mag booster coil in an M47, M48 and M48A1 tank while the power pack is in the tank to be a rough, tough job. Taking it out isn't too bad, but the real job comes in when you gotta replace it.

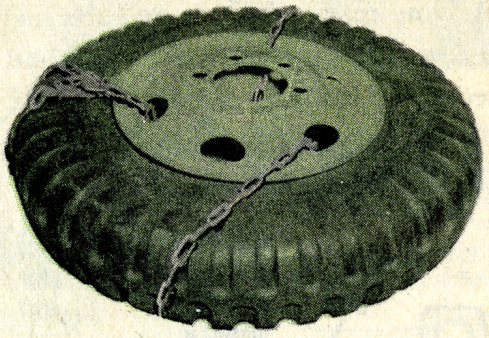
So, what we did was take the bracket off and slot the stud holes. Now, all we do is start the nuts on their way on the studs and then slip the bracket on the studs. Then, just tighten up on the two already started nuts.

SP3 Carl F. White
Fort Stewart, Ga.



(Ed Note — Sounds fine. Mebee a good idea, tho, to use a couple of external tooth lockwashers to make sure the mag booster won't loosen up.)

SAFETY CHAIN



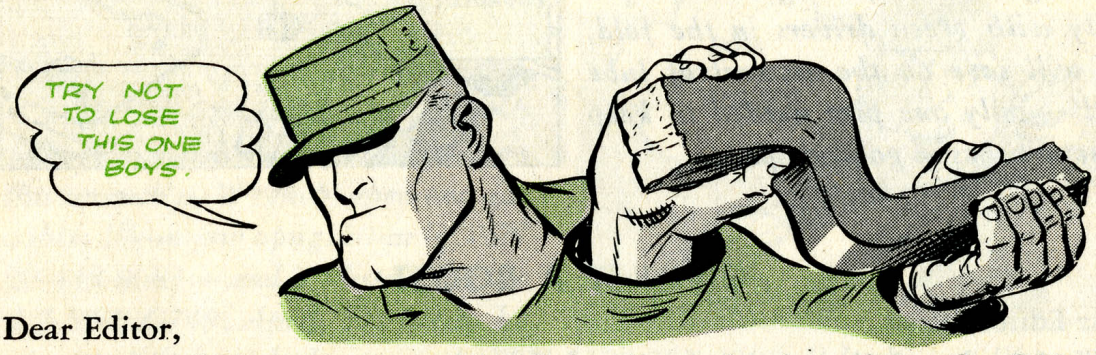
Dear Editor,

Here's a photograph of a little trick we use in the motor pool of the Combined Battalion at Fort Rucker to prevent injury in case a tire bead-lock should carry away while we're inflating the tire. We have an old side chain from a worn out set of 2½-ton truck tire chains. We wrap this chain around the tire and wheel several times and fasten the end clip.

You can see that if the bead-lock should fly off, it won't go far enough to do any harm.

CWO D. W. Roberts
Fort Rucker, Alabama

CRANKING GOOD IDEA



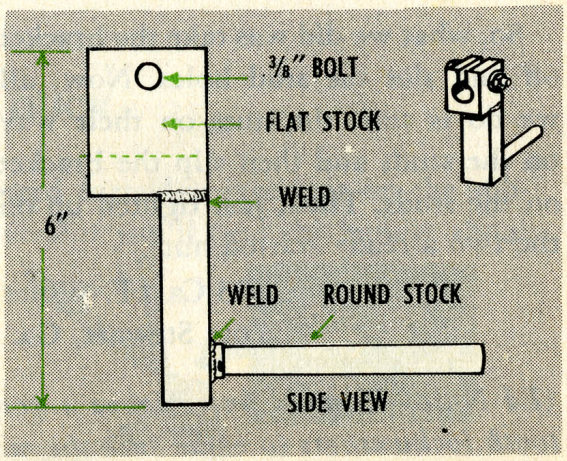
Dear Editor,

Every so often, we lose a crank off the tilt mechanism of our Cat D7's. The cranks work loose or get knocked off the pinion in brush and trees.

After replacing a few cranks, we found it's faster — and a lot cheaper — to make 'em ourselves. It takes three pieces of scrap metal, two welds, drilling a hole, and a cut.

All it amounts to is using your own material to make a crank just like the regular part. It takes about one man hour.

Mr. Walter F. Cook
Aberdeen Proving Ground, Md.



(Ed Note — Nice way to save money.)

CONNIE'S BRIEFS

Somebody goofed

Yep! Slaved his M48-series tank with the master relay switch on. This fused the breaker contact points in the generator-regulator control-box, and burned up the regulator. Moral: Your breaker points will be real gone—if you slave with the master switch on. Stick to the slaving tips in TM 9-7012 para 75c and TB Ord 537 (Sept 56) for quick, painless starts.

Left anything?

Don't forget when the orders come down for your unit to move . . . take your PS file with you. Supplies of early issues are getting low, and a full set nowadays is hard to find.

New tool

Did you Corporal missile repairmen get the new, better-working adapter bar for removing, installing and torquing the stabilizer attaching bolts on your missiles? TB Ord 674 (6 Mar 57) tells you how to make the new tool. It replaces the one in your TOOL SET, special, organizational maintenance, missile repair, CORPORAL II.

Quack, quack

Whoa, boy, before you start drilling drain holes in the door sills and door bottoms of those G749-series 2½-ton trucks, like MWO Ord G1-W102 (15 Apr 57) says. Do it, and chances are you'll find yourself paddling around in water that'll drain into the cab. Those holes in the door bottom will lead right into the vehicle's cab—and so will the water. That reference to G749's slipped in, but you'll be hearing different.

Don't be a lug

By luggin' your engines to death. Particularly in your M74 VTR. Remember that your engine develops its rated 525 horses at 2800-RPM, and that the specified governor setting is 2800-RPM. So, any time you see it pull down to 2500 revs, full throttle, drop it down a gear.

Hot stuff

Watch the flange area wear on the road wheel disks for these vehicles—M47 tank, M48-series tanks, M103 tank, M53 Self-propelled Gun and M55 Self-propelled Howitzer. The latest poop is that when it hits ¼-in, replace the disk with a new one and turn in the worn one for rebuild.

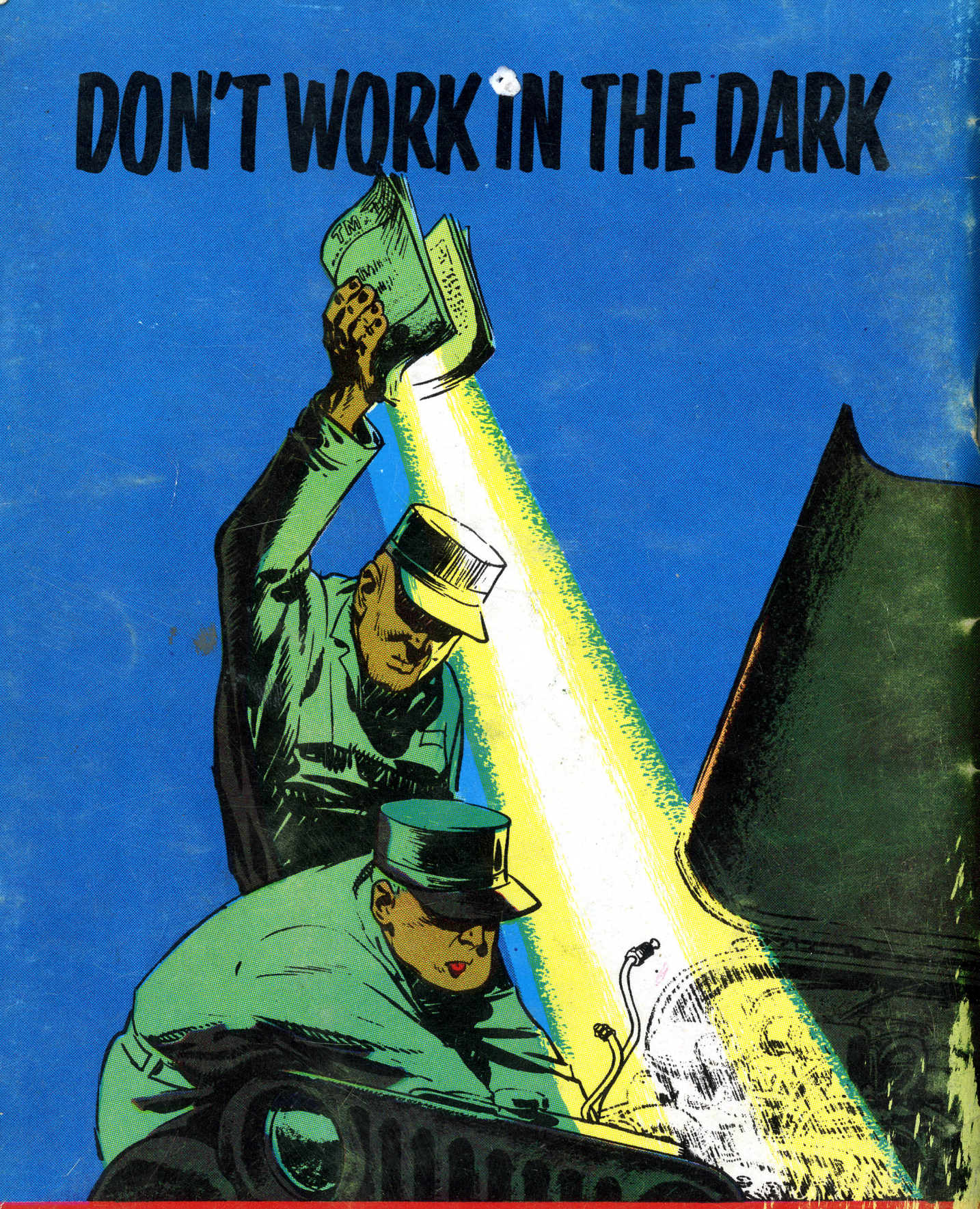
Right light

Your M38A1 (G758) Jeeps need some new numbers. Mark down FSN 6220-772-3899 for the blackout marker light assembly—and FSN 6220-772-9791 for its door component. They go under Group 0609.1, which now has FSN 6220-776-2614 for the light assembly and FSN 6220-752-6030 for the door. These old numbers won't get you the right light fit.

Reproof no more

Crews with the M52, M53 and M55 self-propelled weapons: Get out your Weapon Record Book and block out any notes that tell you to reproof your weapon at various angles of elevation after you've latched onto the shooter as the first user. Everything was taken care of when the weapon and its mount were modified or manufactured.

DON'T WORK IN THE DARK



YOUR TM CAN THROW A LOT OF LIGHT IN THOSE DARK MAINTENANCE CORNERS